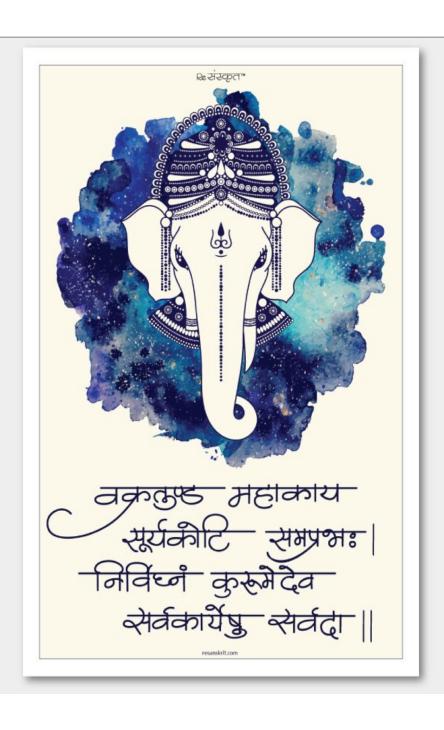
Scientific Angkor & Borobudur I



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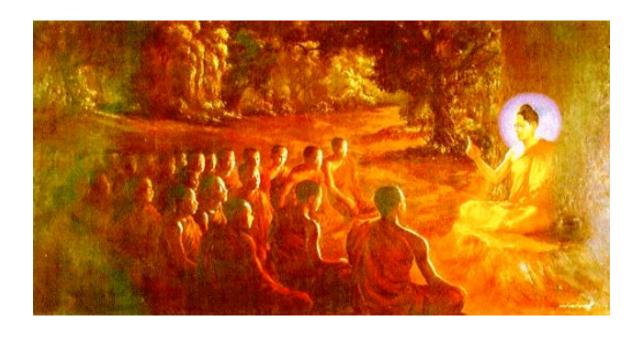
Scientific Angkor & Borobudur

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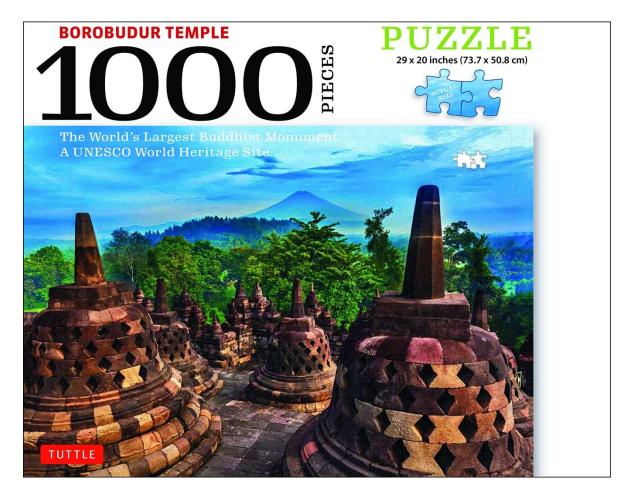


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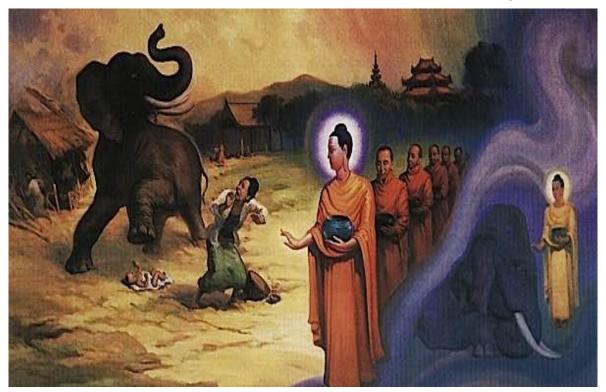




Buddhism and Hinduism have common origins in the Ganges culture of northern India during the "second urbanisation" around 500 BCE. They have shared parallel beliefs that have existed side by side, but also pronounced differences Both originated in Northern India, but later expanded throughout Asia around 500 BCE.

Buddhism attained prominence in the Indian subcontinent as it was supported by royal courts, but started to decline after the Gupta era and virtually disappeared from India in the 11th century CE, except in some pockets. It has continued to exist outside of India and had become the major religion in Cambodia and Indonesia.

Indo Nordic Author's Collective, Stockholm SWEDEN and Nagpur INDIA



SCIENTIFIC ANGKOR & BOROBUDUR

rst Edition 2021

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ISBN No. applied for. Cost U S \$150. I N R 1500/- Euro 120

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CHAPTER I



Some Quintessentials of Hindu Temple Architecture in General paving way to understanding the Hindu Temples of Angkofr(Khemer Empire)

Hindu Temple Beginning with humble caves and squat flat-roofed temples, Hindu architecture, then, evolved over the centuries and, despite some regional variation, arrived at a standard arrangement which involved a huge walled complex with massive decorative gateways giving entrance to a sacred space of lesser shrines dominated by the main temple and its monumental series of towers. The design has become so standard that it is copied even today in temples across the world from New Delhi to Malibu, California

MOST of the art and architectural remains that survive from Ancient and Medieval India are religious in nature. That does not mean that people did not have art in their homes at those times, but domestic dwellings and the things in them were mostly made from materials like wood and clay which have perished. Although we have focussed mostly on Hindu temples, at the end of the paper you will find some information on major Buddhist and Jain temples too. However, at all times, one must keep in mind that religious shrines were also made for many local cults in villages and forest areas, but again, not being of stone the ancient or medieval shrines in those areas have also vanished. The study of images of deities falls within a branch of art history called 'iconography', which consists of identification of images based on certain symbols and mythologies associated with them. And very often, while the fundamental myth and meaning of the deity may remain the same for centuries, its specific usage at a spot can be due to its geographical, cultural or social context.

Indian architecture encompasses a wide variety of geographically and historically spread structures, and was transformed by the history of the Indian subcontinent. The result is an evolving range of architectural production that, although it is difficult to identify a single representative style, nonetheless retains a certain amount of continuity across history. The diversity of Indian culture is represented in its architecture. It is a blend of ancient and varied native traditions, with building types, forms and technologies from West and Central Asia, as well as Europe. Architectural styles range from Hindu temple architecture to Islamic architecture to western classical architecture to modern and post-modern architecture.

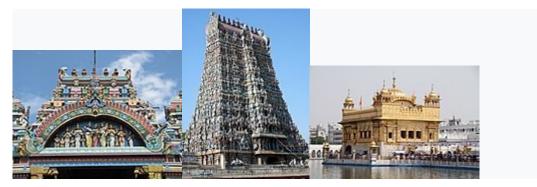
India's Urban Civilization is traceable originally to Mohenjodaro and Harappa, now in Pakistan. From then on, Indian architecture and civil engineering continued to develop, manifesting in temples, palaces and forts across the Indian subcontinent and neighbouring regions. Architecture and civil engineering was known as *sthapatya-kala*, literally "the art of constructing".

Indian rock-cut architecture provides the earliest complete survivals of Buddhist, Jain and Hindu temples. The temples of Aihole and Pattadakal are well-known early examples of Hindu temple architecture, when the temple was taking on its final form. This was more or less set out in the *Sulbasutras*, appendices to the Vedas giving *rules for constructing altars*, with detailed geometrical and ritual requirements. "They contained quite an amount of geometrical knowledge, but the mathematics was being developed, not for its own sake, but purely for practical religious purposes." Nonetheless, there is great variety in the details and decoration of regional and period styles, for example in Hoysala architecture, Vijayanagara architecture and Western Chalukya architecture.

During the Mauryan Empire and Kushan Empire, Indian architecture and civil engineering reached regions like Baluchistan and Afghanistan. Statues of Buddha were cut out, covering entire mountain cliffs, like in Buddhas of Bamyan, Afghanistan. Over a period of time, the ancient Indian art of construction blended with Greek styles and spread to Central Asia.

The rule of the Delhi Sultanate, Deccan Sultanates and Mughal Empire led to the development of Indo-Islamic architecture, a style that combined Islamic influences with traditional Indian styles.

During the British Raj, a new style of architecture known as the Indo-Saracenic revival style developed, which incorporated varying degrees of Indian elements into the British style. The Churches and convents of Goa which is cast in the Indian Baroque Architectural style under the orientation of the most eminent architects of the time. It is a prime example of the blending of traditional Indian styles with western European architectural styles.



Detail of the Meenakshi Temple/The Golden Temple in Amritsar (Punjab, India)

Hindu architecture is a traditional Hindu system of temple architecture, monasteries, mausoleums and other architectural religious buildings of Hinduism. The science of Hindu architecture (principles and standards, where and how temples should be built, design rules) in India is described in Hindu texts — Vastu shastra (Manasara etc), and Shilpa Shastras deal with forming statues, icons, stone murals, painting and others.

By far the most important, characteristic and numerous examples of Hindu architecture are Hindu temples, with an architectural tradition that has left surviving examples in stone, brick, and rock-cut architecture dating back to the Gupta Empire. These drew on earlier Buddhist (and to some extent Jain) religious architecture, but Hindu temples were shaped by their rather different religious requirements, which in essence have remained unchanged since the earliest period.

There is far less secular architecture that can really be called "Hindu" rather than "Indian". Very little early palace architecture survives, and the great majority of surviving palaces show clear influence from Indo-Islamic architecture, especially Mughal architecture, later joined by European architecture. The same is true of most samadhi, tombs or mausoleums, generally only built for ruling families or important religious figures. Burial by interment rather than cremation has traditionally been unusual in Hinduism, and elaborate memorial buildings are a custom largely influenced by Islamic examples.

From the 1st century CE a new type of worship known as Bhakti or devotional **Hinduism** spread across the Indian sub-continent, and the old Vedic aods were replaced importance in bv deities like **Shiva**, **Vishnu**, **Krishna**, **Brahma**, and **Devi**. These gods would become the central figures of Hinduism and their worship required temples where the devoted could offer their thanks and reveal their hopes for a better life.

Buildings were constructed which could house a sacred symbol of a particular god, which could be decorated with sculptural figures of them so recalling episodes from their mythological adventures, and which provided a space for worshippers to leave offerings and perform rituals such as bathing and dancing by professional female dancers (*devadasi*). The **temple** was considered the dwelling place of a particular god (*devalaya*). It was, therefore, a sacred place (*tirtha*) where heaven and earth meet and, as a god's home, it must be a suitably splendid **palace** (*prasada*). The needs of the god would, additionally, be supervised by a dedicated body of priests (*pujaris*) who attended the temple.

TEMPLES WERE BUILT TO HOUSE A SACRED SYMBOL OF A PARTICULAR GOD AND WERE DECORATED WITH SCULPTURAL FIGURES RECALLING EPISODES FROM MYTHOLOGY.

Hindus need not attend regular services, but an occasional walk around the temple interior (circumambulation), known as *pradaksina* and done in a clockwise direction, was considered auspicious. Further, they could say prayers, look at the god's representation – a specific act of piety known as *darsan* – and leave offerings of food and flowers (*puja*). Temples, inevitably, became the very centre of a community and, accordingly, their upkeep was guaranteed by land grants and endowments from the ruling class, as indicated by inscriptions on many temples.

Early Influences

Influenced by early **Buddhist** structures such as the **stupa**, the first Hindu temples were built from rock-cut caves and repeated the idea of relief panels and the decorative *gavaska* window form. Then, with the arrival of **Gupta architecture** in the 4th to 5th century CE, the first free-standing Hindu temples were constructed with features such as towers and projecting niches.

The first materials used were wood and terracotta, but architects gradually moved on to brick and stone, especially sandstone, granite, schist, and marble. No mortar was used in the older temples and so precise cutting of dressed stones was required. Outstanding examples of influential cave temples include those at Udaigiri in Malwa and date to the 5th century CE. Early free-standing temples survive at Deogarh and include the 6th century CE Dasavatara temple dedicated to Vishnu.



Durga Temple, Aihole by Jean-Pierre Dalbera (CC BY)

Hindu Temple Features

The Hindu temple (mandir) is laid out according to the eight cardinal directions, and a god representing each one (dikpala) may sometimes be represented in sculpture on the temple's exterior. Built on an elaborately carved platform (adhisthana), the temple is often referred to in ancient Hindu texts on architecture (the Vastu Shastras) as the sacred mountain Meru or Kailasa, the dwelling of Shiva in the Himalayas. Indeed, seen from afar, and especially from above, many Hindu temples, with their multiple towers, appear very much like a mountain mass. The 11th century CE Kandariya Mahadeva temple at **Khajuraho** and 12th century CE Rajarani temple at **Bhubaneswar** are outstanding examples of this effect.

The most important part of a Hindu temple is the *garbhagriha* (translated as 'womb-chamber'), which is a small window-less shrine room located at the very heart of the temple. Within, a symbol or representation of a specific god was placed, for example, the *linga* (phallus) for Shiva. Worshippers consider that energy flows out in all directions from the *garbhagriha*, and this is reflected in the architecture of the surrounding parts of the temple. For example, on three sides temples have blind doors which symbolically allow the deity's energy to leave the inner *garbhagriha*. These portals (*ghana dvara*) may also act as secondary niche shrines for the deity too.



Gopura & Nataraja Temple, Chidambaram.by Jean-Pierre Dalbera (CC BY)

Early temples consisted of only a *garbhagriha*, but over time additions were built and copied across temple sites to create, by the 10th century CE, a canonical architectural style. The most obvious of these features were a portico entrance (*ardhamandapa*) and pillared hall (*mandapa*) which led to the *garbhagriha* – features which developed in the Deccan from the 8th century CE. Even more impressive, above the *garbhagriha* a huge corbelled tower was constructed, the *sikhara*. One of the earliest examples incorporating these features can be found in Aiholi and the 8th century Durga temple, whilst one of the most ornate is the 12th century CE Nataraja Temple at **Chidambaram** in the Tamil Nadu.

Nagara & Dravida Temples

Architecture evolved slightly differently in different regions, such as the distinct features of Orissa, Kashmir and Bengal temples, but two general types are identified as the Nagara (North) and Dravida (South) styles. The *sikhara* tower in Nagara temples have a sloping curve as they rise, have decorative arches known as *gavakshas*, and are topped by an *amalaka* - a large fluted stone disk - and also a small pot and finial. The walls of Nagara temples present a complex exterior of projections (known as ratha and ultimately there would be seven on each side) which create many recesses. In contrast, Dravida towers (known separately as vimana) are more domelike with cornices, and they are topped by another smaller dome. The exterior walls of Dravida temples have regular entablatures which often contain sculpture. Southern Indian temples can also have a ritual bathing tank or pool (nandi mandapa), may have a barrel-vaulted (shala) roof, and are typically enclosed within a walled courtyard with a gate (*gopura*) which over time would become even more massive and ornate than the temple itself. The 11th century CE Brihadishvara Temple complex at **Tanjavur** is a wonderful example which incorporates all of these features.



Brihadishvara Temple, Thanjavur..by Aravindreddy.d (CC BY-SA)

Hindu temple architecture has many varieties of style, though the basic nature of the Hindu temple ("mandir") remains the same, with the essential

feature an inner sanctum, the *garbha griha* or womb-chamber, where the primary *murti* or the image of a deity is housed in a simple bare cell. Around this chamber there are often other structures and buildings, in the largest cases covering several acres. On the exterior, the garbhagriha is crowned by a tower-like *shikhara*, also called the *vimana* in the south. The shrine building often includes an ambulatory for *parikrama* (circumambulation), a *mandapa* congregation hall, and sometimes an *antarala* antechamber and porch between garbhagriha and mandapa. There may further mandapas or other buildings, connected or detached, in large temples, together with other small temples in the compound. There are examples of special dance pavilions (*Nata Mandir*), like in the Konark Sun Temple. The pool, temple tank (*Kunda*) is also part of the temple for ablutions.

- 1. **Gopurams-**Essentially independent architectural structure is an element of the temple complex as *gopuram*, viz., gatehouse towers, usually ornate, othen with colossal size, at the entrance of a Hindu temple of Southern India.
- 2. **Hindu monasteries** such as Mathas and hermitages (Ashrams) are complexes of buildings include temples, monastic cells or the communal house and ancillary facilities. [6] In some currents of Hinduism, places of pilgrimage have become Bhajana Kutir, viz., meditation huts of the saints.
- 3. **Samadhi (shrine)** is a tomb (mausoleum) which may or may not contain the body of the deceased. Samadhi sites are often built in this way to honor people regarded as saints.
- 4. **Ratha:** In some Hindu sites, there are shrines or buildings named rathas because they have the shape of a huge chariot.
- 5. **Torana** is a free-standing archway for ceremonial purposes seen in the Hindu, Buddhist and Jain architecture in front of the temples, monasteries and other objects, sometimes as single building.
- 6. **Stambha** is used in the context of Hinduism and Jainism to denote pillar or column, [11] e. g. dedicated to Vishnu «Tower of victory» (Vijay Stambha) at Chittorgarh fort, Rajasthan.
- 7. **«Dhvaja-stambhas»** are founding at the entrance of temples as flagstaffs, often with the image of lingam and sacred animals.
- 8. **Chhatris** are elevated, dome-shaped pavilions used as an element in Indian architecture, originating in Rajasthani architecture. They are widely used in palaces, in forts, or to demarcate funerary sites, etc.
- 9. **Ghat** is a series of steps leading down to a body of water, particularly a holy river or lake.

10. Goshalas are protective shelters for cows as sacred animals in India. Goshalas focus on treating cows well, because of their religious significance in Hinduism and consequent cultural sensitivity towards their welfare. There is the abode or sanctuary for cows, calves and oxen.

The role played by patron-kings and their political interests in Hindu temple building in India's Early Medieval period (ca. 550 to 1200) is not insignificant.. This is a significant aspect of my larger study on the Early architectural tradition and is important for any general survey of Hindu temple architecture in India. The critical position of early architecture within the developmental trajectory of the Southern (Dravida) architectural style of Hindu temple or Nothern style dependant on the Partonages of Kings and Dynasts; for example the Pallava dynasty's Rajasimehshvara Temple (ca. 725), which bears an inscription left on its walls by king Vikramaditya II, ruler of the Early Chalukya dynasty at Pattadakal, Karnataka. Vikramaditya II's Virupaksha Temple at Pattadakal (ca. 733-744) was built commemorate his three victories against the Pallavas; it also illustrates the king's admiration for the Rajasimheshvara Temple through a reappropriation of some of the iconography found there. In turn, the Virupaksha Temple inspired the Kailashanatha Temple (Cave 16) at Ellora (ca. 756-773), created by the Rashtrakuta king who brought the Early Chalukya dynasty to an end. Temple architecture and temple sculpture were among the types of symbolic objects frequently seized by a conquering king. In the case of architecture—impossible to move from its original context an appropriation of architectural forms was a means to lay claim to the seat of a rival's personal deity.

Thus, the concretization of the ideologies of Hindu kingship, and the assumption of public perceptions of political success and military glory by one political entity from another; demonstrates the geographic range of particular iconographies and their meanings and indicates a jexibility in a community's iconologic preferences; and shows the multi-centered nature of the development of free standing Hindu temple architecture even while special local manifestations remain signiacant.

The role of politics and kingship in the ideology behind monumental stone temple building is a pan-Indian phenomenon of royal patrons expressing their political aims and aspirations through temple construction was the primary impetus for large-scale Hindu temple construction until at least the late 12th century.

Patronage by Kings: The world of the Hindu king at this time saw temple-building as a highly visible political act as well as one of devotion. Temple-building had become, by the seventh century and probably earlier, a

necessary component of Hindu kingship; and it made visible the efficacy and scope of kingship—recalling and reinforcing the king's power as well as his authority to rule. As temples became necessary to kingship, temples constructed of permanent materials were being built in larger and larger numbers and, eventually, and where possible, on a larger and larger scale. The fact that temple-building regarded as a condition of kingship and successors can be explained, in part, with reference to the concept of the king's duty, his rajadharma.

TEMPLE BUILDING MANUALS (AGAMA SHASTRA) & ITS ROLE

Hinduism

Hinduism, the ancient Indian religious system, is arguably one of the most complex of known religions and its complexity has become one of its many characteristics.

Unlike most religions that base their faith on one definitive set of guidelines and rules, Hinduism does on confine itself to a single text, or a single interpretation or a single approach—which is also why it is so vibrant and rich. Given this heterogeneous character, rules, regulation, norms and guidelines of the Hindu way of worship, spirituality and all other aspects of the religion, have to be seen, always, in a larger context.

Agama Shastra

Agama Shastra, a collection of ideas that lays down the rules for worship, temple building, spirituality and rituals, has for long been a guideline for many people of the Hindu faith. It is a collection of Sanskrit, Tamil and Grantha scriptures that contains, mainly, methods of temple construction, idol creation, philosophical doctrines and meditative practices. As a compendium of sorts that came into being after years of assimilation and from a variety of sources, the Agama shastra as a whole cannot be dated; some parts of it being pre vedic while the others are post vedic.

Role of Agama Shastra in Temples Construction and Worship

As the complete guide, Agama Shastra plays a very important role in consecration and construction of holy places; most Hindu places of worship follow the tenets of the Agama Shastra.

The Four Padas

While the Agama are many in number, each of them consists of four parts: Kriya Pada, Charya Pada, Yoga Pada and Jnana Pada. While Kriya Pada expounds more tangible rules- rules of construction, sculpting, carving consecration of Idols etc. the Jnana Pada deals with something more lofty, the philosophy and spirituality of temple worship.

Temples and places of worship cannot be built arbitrarily or on the strength of some local notion, for everything is laid down categorically in the Agama shastra. For example, for a pilgrimage the three essentials are Sthala, Tirtha and Murthy, where the Sthala refers to the place of the temple, the Tirtha signifies the temple tank and Murthy stands for the idol. There are rules in the Agama Shastra for just about every aspect, including the smallest detail, from the positioning of the holy figurine to the materials from which the temple is to be constructed.

Unlike the Vedic guidelines, that focus more on Havan Building, Agama Shastra dwells at length on idols and figurines of the deities. It dwells in such detail that it is in places almost like a scientific blue print for temple making. Given how temples in India are spread, over a vast territorial space, it is amazing how Agama Shastra is employed and followed throughout the majority of these temples, notwithstanding the cultural and regional differences; perhaps, there is something divine about the Agama Shastra.

There are 2 parts of texts. Shruthi and Smrithi. Shruthi is the one that is heard and Smrithi is one that is remembered. Shruthi is said to be heard by Rishis in the deep meditation and hence termed as Apurusheya. Shruthi consists of 2 parts. The Nigamas and the Agamas (derived from Nigamas). Nigamas are Vedas which are 4 in number. Rig, Yajur, Sama, Atharva. Agamas are 3+ additionals in number Shaiva, Shakta, Vaishnava and additionals (Ganapathya, Soura, Kaumara etc.). Now to explain this, consider Vedas (Nigamas) as pure science and Agamas as applied science.

Or you can consider Vedas as theories and Agamas as application of theory in practical. Like Vedas are Physics, Chemistry Biology Mathematics and Agamas are engineering (Application of PCMB).

The Vedas were very vast and initially thought in 21 schools (Shakas) for Rigveda alone. Rigveda Shakas were 21, Yajurveda Shakas were 100, Samaveda Shakas were 1000 and Atharvaveda Shakas 19. But today the collectively we have only 1 Shaka of each of the Veda and remaining are lost over a long period of time. There are Upavedas attached to the Vedas, like Ayurveda (Upaveda of Atharvaveda), Dhanurveda (Upaveda of Yajurveda) Gandharvaveda (Upaveda of Samaveda), Shilpashastra, Natyashastra, Jyothishya etc.

Smrithi consists of Dharma Shastra, Grihya Sutras, and Puranas, among which 18 are Maha Purana (Higher) and 18 are Upa Purana (Lower) and there are other Puranas as well which are tertiary. Puranas has historical, geographical, astronomical and many other data written by Rishis who have witnessed the incidents occuring. And the Epics Ramayana and Mahabharatha are called Itihasa which means history as it happened, again recorded by Rishis, they too has large amount of astronomical, geographical and other data embedded.

According to the Agamas derived from the Vedas, ancients established 4 paths and they are Shaiva, Shaktha, Vaishnava and Smartha. Shaiva followers consider Shiva as Supreme, Vaishnavas consider Vishnu, Shakatas consider Shakthi or Devi (wife of Shiva) and Smarthas consider 5 gods, Shiva, Vishnu, Devi, Surya and Ganesha as equals and follow any of them or many of them as Supreme. In South Indian Smartha tradition they also include Karthikeya as the 6th god. This Smartha tradition was established by Shankaracharya in the process of unifying the different traditions coming under the influence of Vedas.

All Hindus follow one among these and in India people who were not happy with these established their own paths, thus, Jainism, Buddhism, Sikhism were established. There is no process of any kind of conversion like in Islam or Christianity. You just follow which you prefer to and if you do not prefer anything, since you are born in a family following one of these traditions, you are labelled to that.

However people did not require all that is in the Vedas completely in the medival times for an individual to lead his life meaningfully and to attain moksha. Hence just the major portion which was required was captured in Upanishads as the hidden knowledge of Vedas and hence can be called as the heart of Vedas. Later even the Upanishads became too much for the modern day and lifestyle that we follow. We don't have enough time to study everything and hence the Bhagavatgita was enough. It captures the most important teachings of the Upanishids and hence can be called as the heart

of the Upanishads. That is the reason Bhagavadgita holds a position equal to that of Shruthi even though it is a part of Smrithi text Mahabharatha.

We have everything that mankind wants in order to live, prosper and attain liberation even after most of the Vedas are lost. We cannot even imagine what complete Vedas could have got. Together the Vedas, Upavedas, Agamas, Puranas, Itihasas and other Smrithis have so much for us. It has concepts like Evolution, Aeroplanes, Atomics, Physics, Metallurgy, Batteries, Test Tube Babies, Medicine, Surgeries like Plastic Surgery, Science and things that are yet to be discovered.

The **Agamas** means tradition or "that which has come down", and the Agama texts describe cosmology, epistemology, philosophical doctrines, precepts on meditation and practices, four kinds of yoga, mantras, temple construction, deity worship and ways to attain sixfold desires. These canonical texts are in Sanskrit, Telugu and Tamil (written in Grantha script, Telugu script and Tamil script).

The three main branches of Agama texts are Shaiva, Vaishnava, and ShaktaThe Agamic traditions are sometimes called Tantrism, although the term "Tantra" is usually used specifically to refer to Shakta Agamas. The Agama literature is voluminous, and includes 28 Shaiva Agamas, 77 Shakta Agamas (also called Tantras), and 108 Vaishnava Agamas (also called Pancharatra Samhitas), and numerous Upa-Agamas.

The origin and chronology of Agamas is unclear. Some are Vedic and others non-VedicAgama traditions include Yoga and Self Realization concepts, some include Kundalini Yoga, asceticism, and philosophies ranging from *Dvaita* (dualism) to *Advaita* (monism). Some suggest that these are post-Vedic texts, others as pre-Vedic compositions dating back to over 1100 BCE. Epigraphical and archaeological evidence suggests that Agama texts were in existence by about middle of the 1st millennium CE, in the Pallava dynasty era.

Scholars note that some passages in the Hindu Agama texts appear to repudiate the authority of the Vedas, while other passages assert that their precepts reveal the true spirit of the Vedas. The Agamas literary genre may also be found in Śramaṇic traditions (i.e. Buddhist, Jaina, etc.). Bali Hindu tradition is officially called *Agama Hindu Dharma* in Indonesia

 $\bar{A}gama$ (Sanskrit $\Box\Box\Box$) is derived from the verb root $\Box\Box\Box$ (gam) meaning "to go" and the preposition \Box (\bar{a}) meaning "toward" and refers to scriptures as "that which has come down".

Agama literally means "tradition", and refers to precepts and doctrines that have come down as tradition. Agama, states Dhavamony, is also a "generic name of religious texts which are at the basis of Hinduism and which are divided into Vaishnava Agamas (also called Pancaratra Samhitas), Shaiva Agamas, and Shakta Agamas (more often called Tantras).



Developing physical and mental discipline with Yoga is one of four recommendations in Agama texts. Above a Yoga posture statue from Kashmir, a center of monistic Agama texts.

Agamas, states Rajeshwari Ghose, teach a system of spirituality involving ritual worship and ethical personal conduct through precepts of a god. The means of worship in the Agamic religions differs from the Vedic form. While the Vedic form of yajna requires no idols and shrines, the Agamic religions are based on idols with puja as a means of worship. Symbols, icons and temples are a necessary part of the Agamic practice, while non-theistic paths are alternative means of Vedic practice. Action and will drive Agama precepts, while knowledge is salvation in Vedic precepts. This, however, does not necessarily mean that Agamas and Vedas are opposed, according to medieval-era Hindu theologians. Tirumular, for example, explained their link as follows: "the Vedas are the path, and the Agamas are the horse".

Each Agama consists of four parts

- Jnana pada, also called Vidya pada- consists of doctrine, the philosophical and spiritual knowledge, knowledge of reality and liberation.
- Yoga pada precepts on yoga, the physical and mental discipline.
- Kriya pada consists of rules for rituals, construction of temples (Mandir); design principles for sculpting, carving, and consecration of idols of deities for worship in temples; [26] for different forms of initiations or diksha. This code is analogous to those in Puranas and in the Buddhist text of *Sadhanamala*.

• Charya pada – lays down rules of conduct, of worship (puja), observances of religious rites, rituals, festivals and prayaschittas.

The Agamas state three requirements for a place of pilgrimage: Sthala, Tirtha, and Murti. Sthala refers to the place of the temple, Tirtha is the temple tank, and Murti refers to the image of god (usually an idol of a deity). Elaborate rules are laid out in the Agamas for Silpa (the art of sculpture) describing the quality requirements of the places where temples are to be built, the kind of images to be installed, the materials from which they are to be made, their dimensions, proportions, air circulation, lighting in the temple complex, etc. The Manasara and Silpasara are some of the works dealing with these rules. The rituals followed in worship services each day at the temple also follow rules laid out in the Agamas.



Temple design (Shore temple) and iconography such as the *Nataraja* (Dancing Shiva) are described in the Agama texts.

Philosophy: The Agama texts of Hinduism present a diverse range of philosophies, ranging from theistic dualism to absolute monism. This diversity of views was acknowledged in Chapter 36 of Tantraloka by the 10th-century scholar Abhinavagupta In Shaivism alone, there are ten dualistic (dvaita) Agama texts, eighteen qualified monism-cum-dualism (bhedabheda) Agama texts, and sixty-four monism (advaita) Agama texts. The Bhairava Shastras are monistic, while Shiva Shastras are dualistic.

A similar breadth of diverse views is present in Vaishnava Agamas as well. The Agama texts of Shaiva and Vaishnava schools are premised on existence of Atman (soul, self) and the existence of an Ultimate Reality (Brahman – called Shiva in Shaivism, and Vishnu in Vaishnavism). The texts differ in the relation between the two. Some assert the dualistic philosophy of the individual soul and Ultimate Reality being different, while others state a Oneness between the two. Kashmir Shaiva Agamas posit absolute oneness, that is God (Shiva) is within man, God is within every being, God is present everywhere in the world including all non-living beings, and there is no spiritual difference between life, matter, man and God. The parallel group among Vaishnavas are the Shuddhadvaitins (pure Advaitins).

Scholars from both schools have written treatises ranging from dualism to monism. For example, Shivagrayogin has emphasized the non-difference or unity of being (between the Atman and Shivam), which is realized through stages which include rituals, conduct, personal discipline and the insight of spiritual knowledge. This bears a striking similarity, states Soni, to Shankara, Madhva and Ramanujan Vedantic discussions.

Relation to the Vedas and Upanishads

The Vedas and Upanishads are common scriptures of Hinduism, states Dhavamony, while the Agamas are sacred texts of specific sects of Hinduism. The surviving Vedic literature can be traced to the 1st millennium BCE and earlier, while the surviving Agamas can be traced to 1st millennium of the common era. The Vedic literature, in Shaivism, is primary and general, while Agamas are special treatise. In terms of philosophy and spiritual precepts, no Agama that goes against the Vedic literature, states Dhavamony, will be acceptable to the Shaivas. Similarly, the Vaishnavas treat the Vedas along with the Bhagavad Gita as the main scripture, and the Samhitas (Agamas) as exegetical and exposition of the philosophy and spiritual precepts therein. The Shaktas have a similar reverence for the Vedic literature and view the Tantras (Agamas) as the fifth Veda.

The heritage of the Agamas, states Krishna Shivaraman, was the "Vedic peity maturing in the monism of the Upanishads presenting the ultimate spiritual reality as Brahman and the way to realizing as portrayed in the Gita"

The Veda is the cow, the true Agama its milk.

— Umapati, Translated by David Smith

Textual roots

The Hindu treatise *Vishnudharmottara Purana* describes several temples including a "Sarvatobhadra temple", which has been compared by archaeologists and Indologists with the Dashavatara Temple (Vishnu temple) or the Gupta Mandir of Deogarh. According to Lubotsky, a comparative study suggests that the ideal temple design and iconography described in the treatise as "Sarvatobhadra temple" was the same as the Vishnu temple of Deogarh. This conclusion was based on plan, size, iconography and several other norms described for building the Sarvatobhadra style Hindu temples. Based on this comparison, the structural details of the Deogarh temple have been inferred. Maps have also been drawn of the temple structure. The probable date of the temple's construction has been estimated to be between 425 and 525.

The Sarvatobhadra design requires a superstructure with nine sikharas. The Dasavatara temple at Deogarh shows only one "shikara", and right squares with no remnant structure. Lubotsky acknowledges that this aspect of the

Sarvatobhadra design cannot be fully established by existing evidence. However, the supporting features of copings and amalakas (a bulbous stone finial) have been found in the ruins, which supports the theory that more shikaras existed on eight mandapas, as part of the temple.

Four stairways outside the platform provide access to the temple. However, as per excavation details, combined with the two small shrines with the central shrine seen now, the layout of the temple has been interpreted to represent a typical *Panchayatana* style of the temples of North India. The total height of the shrine based on isometric projections is about 45 feet (14 m). Provision of porches has not been corroborated but some analogous comparison with the Varaha temple (boar incarnation of Vishnu) in the fort precincts, which belonged to the same period, suggests the existence of porticoes even in the Vishnu temple. Further, a later date Kuriya Bira temple about 2 miles (3.2 km) to the south of the Vishnu temple, has been cited to substantiate that this temple had a mandapa around a small shikara shrine, as required in the Sarvatobhadra design. According to Lubotsky, the Deogarh temple tallied with the description provided for the Sarvatobhadra temple in the ancient treatise of Vishnudharmottara Purana.

CHAPTER II Why Temples of Hindus are built on River Banks or near rivers

In Hinduism, rivers are often regarded as deities. This is because of their significance in the people's lives. In the Rigveda, there are mentions of holy rivers including Saraswati. The river Ganga is considered to be most sacred. Most of the rivers are represented in female form. However, Brahmaputra is considered to be male. It is also believed that the Indus Valley people worshipped the rivers. The most significant 7 rivers are the *Saptanadi*:

- 1. Ganga,
- 2. Yamuna,
- 3. Sindu.
- 4. Narmada,
- 5. Godavari,
- 6. Krishna, and the
- 7. Kaveri.

The Indus Valley civilization grew on the banks of major rivers like the Indus. Vedic civilization also grew on the banks of several major rivers, first in the northwest and later in the Gangetic plains. The rivers Saraswathi, Ganga, Yamuna, Sarayu and the seven rivers (Sapta Sindhu) figure prominently in the Vedic hymns. As manifestations of gods and goddesses, rivers have a divine origin. The River Ganga descends from the heaven itself. Symbolically, it represents liberating consciousness or divine consciousness that flows from the head of a spiritual teacher (Shiva) and purifies everyone who comes into contact with it. According to Vedic legends, Indra released the waters of rivers when they were held a demon.

Rivers accept the offering made by humans and carry them also. Indian rivers are also associated with the birth of great heroes like Kumara, Krishna, Bhishma, and Karna. The origin of the Mahabharata can be traced to the River Ganga where Shantanu met first Ganga and later Satyavathi. Ayodhya, Lord Rama's birth place is located on the banks of the River Sarayu. Many famous Hindu pilgrim centers such as Kasi, Prayaga, Ujjain, Madhura, and many famous Shiva and Vishnu temples are located on the banks of major Indian rivers only.

Hindu not only worship the rivers but also several important places associated with them, such as their birth place, and the places associated with the lives of incarnations, gods and goddesses, and seers. River water is used in daily sacrifices, bathing rituals, purification ceremonies, and sacrificial offerings. According to the Puranas, living on the banks of sacred rivers is a meritorious act. The Brahmanas (priests) who live there are superior to even those who know the Vedas. Offering prayers and sacrifices to rivers is much better than performing sacrificial ceremonies (yajnas).

Goddesses: Ganga



The Vedas and Puranas mention Ganges to be most sacred river. In the legends, goddess Ganga is daughter of Himavan (Himalayas) and Menavati (An apasara). She is the sister of Mother goddess, Parvati. She is the goddess of Purity and Purification as people believe bathing in Ganges removes sins and helps in gaining Moksha. Her mouth is Makara.

Legends also mention that she came down from the heaven. Bhagiratha (an ancestor of Shri Rama) performed a penance to please mother Ganga. He asked her to come down from heaven to liberate his ancestors' spirits. She agreed but also told that are force would destroy the Earth if she directly hits it. Bhagiratha then, asked Lord Shiva to help. Shiva agreed to stand between the Earth and Ganga. Ganga, then came down to earth with her full force. Lord Shiva captured her in his hair and released her gently. Bhagiratha then took her to his ancestors' spirits and later, the ocean.

Yamuna in Hinduism

Yamuna or Yami is the personification of the Yamuna river. She is daughter of Surya, the sun god, and Saranyu, the cloud goddess. She is the goddess of life and the twin of Yama, lord of dead. Her siblings include Tapati, another river goddess. In later texts, she is known as Kalindi.

Saraswati

The goddess Saraswati is not just a river goddess, but also one of the principle goddesses in Hinduism. She is the goddess of knowledge, music, speech and arts. The Saraswati river is mentioned in the Rigveda. It is believed that the river dried up.

In some texts, it is written that once there was a terrible battle between the Bhargavas and Hehayas, and from this an all-consuming fire called Vadavagni was born which could destroy the whole world. The devas were worried and they went to Shiva. Shiva suggested that they should go to Saraswati for help as she can become a river and immerse the Vadavagni in the ocean. All the devas and devis went to Saraswati and requested her to protect the universe. They all went to Bramha and he told Saraswati to become a river. Saraswati agreed and left Brahmaloka and arrived at sage Uttanka's ashram. There she met Shiva. He gave the Vadavagni in a pot to Saraswati and told her to originate from Plaksha tree. Saraswati merged with the tree and transformed into a river. From there she flowed towards Pushkar, which is a sacred place. She continued her journey towards the ocean. At last, she reached the end of her journey and immersed the fire in the ocean. [5]

Narmada

Devi Narmada is the personification of the Narmada river. She is also known as Rewa. She is one of Lord Shiva's daughters. Once, Shiva was meditating. His sweat accumulated and Narmada was born.

She was very beautiful. Gods and demons wanted to marry her. Shiva arranged her wedding with the sea god.



Near Vrindavan, Radha-Kunda (the pond of Radha) is considered especially sacred

Rivers are the basis of Indian religion hence it's very respected and also rivers are the easiest way of gaining water (as we all know water is the base of human life). Rivers are very honourable in indian religion as-

- 1. Rivers are equally respected to mother (mother feed theire baby same as river feed human).
- 2. Rivers are cradle of civilisation as we know there are so many cities developed on the bank of rivers like Kashi , Prayag, Haridwar, Patliputra (Patna) etc.
- 3. Rivers are good source of water, which is the best medium of cleaness and servival. So, people can clean them self very easily and go to temple with clean body and clean heart.
- 4. During the vedic and post vedic era gurukul (Vedic Schoold) were also situated near to river banks and they have a common ritual of having kuldevi (Kuldevta/devi **means** the god(dess) of the 'Kul' or family lineage. These **are** usually temples where the family has been worshipping God for generations, and **can** trace their history to it being their main temple)and kuldevta which also gave birth to situated temples on bank of river.

So, also on that term both river and temple are correlated to each other that's why temples are situated near to rivers.

Temple were built on river banks. They are an invitation to the divine. It is the duty to connect to divine to recharge ourselves with positivity and

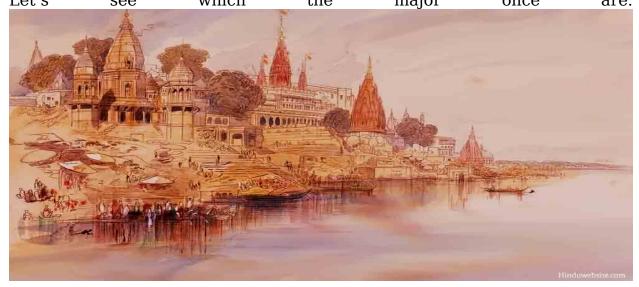
leave negativity from ourselves. Every temple has elements important to increase that energy process or elements to do a specific job at the temple. The basic five elements of nature are Earth, Water, Fire, Air, and Space (out of which everything is created, our bodies as well (basic science)), but still, we need to clean these elements (otherwise we didn't need to take bath). Our bodies are made of 70% of water. Water Has Memory (Nobel Prize laureate Luc Montagnier).

First: Water is the basis of life in a social construct we need it for various purposes even at the temple that's why temples were built near water bodies.

Second: Water is a source of life and resembles the energy (touching bathing and cooking with water near the temples gives a new form of energy),

Third: Water (the energy it possesses overcomes any difficulty in its path (eventually (even dams breaks))) flows taking all the energy (also in form of memory) from yourself and recharge it within the earth. it's up to us which form of energy we would like to lose (negative or positive).

The River Ganga is considered to be the most sacred water body in the entire existence. Indian Mythology, history, and culture everything is widely related to this sacred river. We the Indians consider Ganga as a very powerful and kind Goddess who forms a vital part of our livelihood. The water of this river is believed to be so holy that it can eradicate all the sins of a living being. There are only a few cities which are blessed with the boon of seeing The Ganga flow across their land. The holiness of the river has welcomed the establishment of many historical and mystical temples. Let's see which the major once are.



Another example of temple built on river is he **Sangameswara temple** is a Hindu temple in the Kurnool district, Andhra Pradesh, India. It is located near Muchumarri at the confluence of the Krishna and Bhavanasi rivers, in the foreshore of the Srisailam reservoir where it is submerged for part of the time, surfacing when the water level recedes to a sufficient degree. It was first submerged after the Srisailam Dam was constructed in 1981, and first surfaced in 2003.

The temple's wooden Lingam, Sangameshwaram, is believed to have been installed by Dharmaraja, the eldest of the Pandavas, after their visit to Srisailam Mallikarjuna temple. The temple is considered a place of religious sanctity due to being built at the confluence of seven rivers and remain visible for two months^[3]. (Bhavanasi, Krishna River and five rivers that merge into it beforehand, namely, Veni, Tunga, Bhadra, Bheemarathi and Malapaharini).



In her research artcle Following River Routes and Artistic Transmissions in Medieval Central India, Tamara I. Sears says that travel routes facilitated the transmission of architectural knowledge across central India, not only in major urban centers but also in remote rural places. She focused her research on Kadwāhā, a village in Madhya Pradesh, which emerged as a major temple town during the ninth, tenth, and eleventh centuries. As a group, Kadwāhā's temples reveal a heterogeneity of architectural and sculptural forms that speaks to its status as a key stopping point on the road between Narwar and Chanderī. The paper highlights three ways in which artistic ideas may have been transmitted across vast geographic distances.

1. First, it examines categories of mode and style, traceable through plans and elevations, which likely point to decisions made by architects and patrons.

- 2. Second, it shows how sculptors experimented with and transformed ornamental and iconographic features brought from other regions.
- 3. Third, it turns to religious iconography as a way of mapping the movement of religious practitioners.

Devprayag

This is the most beautiful scenery existing where you can see the merging of Bhagirathi and Alakananda to form the sacred Ganges. Both the rivers joining at one place having different colors looks magical. This is in Tehri Garhwal district in the state of Uttarakhand.

The well-known temples here are

RaghunathJi temple



This temple is located in Jammu and was built by Maharaja Ranjit Singh during the period 1822-1860. This is said to be one of the largest temples of North India and consists of a complex of seven Hindu Shrines which are known as Shikhara. The deity which is worshiped here is said to be the same one which Rama had worshiped during the Ashwamegh Yagnya. DandaNaggaraja temple



This is a very famous temple in Garhwal region and a famous place to visit in Pauri. This place is such located that it is visible from quite far away places as well. Here Lord Krishna is worshiped. It is believed that he had come here in the form of a snake and still resides here. Rishikesh

A place where you can breathe, sleep and eat spirituality. For people facing a stressful life, this is a must location to be visited. This sacred city is situated at the foothills of the Himalayas in Uttarakhand. You will find a lot many old people here who have devoted their rest of the life for the almighty's worship. The significant population comprises of the sadhu babas.

Nilkanth Mahadev Temple



It is a very famous temple across the river Ganga. People claim that this is the place where Lord Shiva had drunk the poison during the most epic Samandar Manthan between the Gods and the Demons.

Kunjapuri Temple



This is one of the 51 Shakti Peethas where a body part of Sati fell. Here Goddess Durga is worshiped. Parmarth Niketan Temple



Parmarth Niketan Temple is more dedicated towards preaching Hinduism to the public. Every day in the sunset, the Arti and Hawan are organized by the Ashram in Ganga on the Parmarth Ghat.

Bharat Mandir Rishikesh



Bharat Mandirwas constructed by the famous saint AdiguruShankracharya in 12th century. Here Lord Rama and his cousin brother Bharat are worshiped. This temple lies in the old town next to TriveniGhat. Geeta Bhawan Rishikesh



This is just on the river bank touching the holy river Ganga. This temple represents the stories of the famous Indian epic Mahabharata and Ramayana in its walls. Here people assemble to read the Ramayana jointly. The Arti performed in the evening in its bank is magnificent and beautiful.

Tera Manzil Temple Rishikesh



This temple is again attached to the river Ganga. This place is very famous because of its beauty and construction. Here all the Hindu Gods and Goddesses are present and are worshiped.

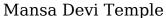
Triveni Ghat Rishikesh



TriveniGhat is the place which is said to wash away sins of your 7 births. This is about 1.5kms away from Rishikesh and is a very sacred place. People in huge numbers come to take bath in the holy river.

Haridwar

Haridwar is one of the top 4 Hindu pilgrimage destinations. The most famous event here is the KumbhMela where lakhs of devotees come rushing from different parts of the world. Here the evening aarti is unexplainably beautiful and magnificent. The place where the aarti is held is known as "Hark i Pauri".





Mansa Devi Temple is dedicated to the worship of goddess Mansa who had emerged from the mind of Sage Kashyapa. This temple is located in Bilvaparvat which stands beside the river Ganga.

Maya Devi Temple



Maya Devi temple is one of the most famous temple in Haridwar. This is also very famous because of the aarti. This is also one of the 51 Shakti peethas.

Har ki Pauri



The most famous place for aarti in the entire world. Big diyas are lit and the Goddess Ganga is worshiped every evening by many pandits. The sight of

this is marvelous and for sure you will feel a blast of sacredness flowing through your body. HarikiPauri is one of the most sacred bathing ghat in India as well. It is said that Krishna had come here and his footprints are still there on the stone walls.

Neeleshwar Temple



Neelaswar Temple is a Hindu temple dedicated to goddess Mansa in the holy city of Haridwar. The temple is located atop a hill which is near the KushavartaGhat.

Sati Kund



Sati Kund is the site of the YagnaKund. It is believed that this is the place where Sati had put herself to fire in her father's Yagnya.

Allahabad

Allahabad is also known as Prayag. The town sits at the point where the Yamuna and the Ganges rivers meet the Saraswati River. There are certain major locations and temples in this city.

Sangam Allahabad (Triveni)



This is the reason why Allahabad is also known as prayag (a place for offerings). This is one of the holiest spots of the country. Here the three rivers Ganga, Yamuna and Saraswai meet at one point. If you go to the spot you can see Ganga and Yamuna meeting at a point, but Saraswati is considered to be a mythical river which flows under the earth and is invisible.

Someshwar Mahadev



SomeshwarMahadev Temple is situated in Naini in Allahabad across the holy area sangam or Triveni. It is dedicated to the worship of Lord Shiva and is one of the EkadaksRudra pilgrimage.

Varanasi

Varanasi is one of those cities which holds many sacred temples. The Ganga ghats here are completely lined with numerous pilgrimage sites. Here are quite a lot of major temples situated and amazing history associated. It is considered as one of the top 7 Pilgrimage sites of Hinduism. There are many significant temples across river Ganga in Varanasi, but we have mentioned a few.

Gauri Kedareshwar Temple

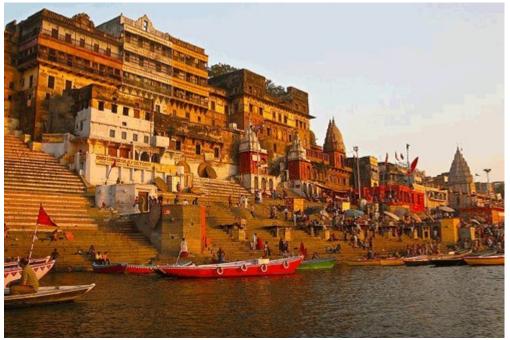


Here Lord Shiva is worshiped in the form of KedarnathShivling. This temple is located on the banks of Ganga on KedarGhat. The deity is a replica of the kedarnath hump ling in Himachal.

Sri Durga Devi Mandir



This is one of the important temples of Varanasi and is dedicated to Goddess Durga. The Durga temple is situated on a rectangular tank, called the DurgaKunda. According to the Puranas, Goddess Durga has kept this place for many centuries and protects the holy city of Varanasi from the South. It is said that the deity worshiped here appeared by its own. Kashi Vishwanath temple



KashiVishvanath Temple is one of the most famous Hindu temples and is dedicated to Lord Shiva. It is located in the western bank of the holy river Ganga and is one of the twelve Jyotirlingas, the holiest of Shiva temples. Lord Shiva is worshiped here and is known as Vishwanath.

Visalakshi Temple



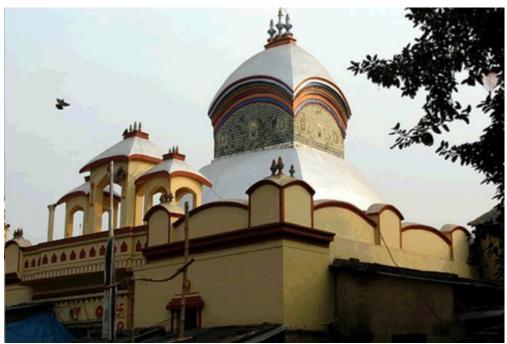
The Vishalakshi Temple is a Hindu temple dedicated to the Goddess Parvati and is known as Vishalakshi. It is located in the Mir Ghat on the banks of the Ganga. This temple is also among the 51 Shakti Peethas. It is said that in this temple the Goddesses eyes and earrings had fallen. Kolkata

Here comes the city of Misthis and fresh fish meat. Not only is it famous because of its delicacies but also because of the history associated. You can say that Kolkata is an all-rounder city having many significance. It also used to be the major place for Britishers and is also a very holy place in terms of presence of temples across river Ganga.

Dakshineswar Kali Temple



It is located on the banks of river Ganga. Here Goddess Bhavatarini is worshiped who is a form of Kali Mata. Near to the main temple there are 12 deities of Lord Shiva established. This is a very famous temple and it is said that it has mythical powers associated. The practice of tantric vidhya is also prevalent here in a very vulnerable amount. Kalighat Kali Temple



This temple is also located on the banks of the holy river Ganga. Over a period of time, the river has slowly moved away from the temple. Goddess Kali is worshiped here and it is considered as one of the 51 Shakti Peethas. Kalighat represents the site where the toes of the right foot of Sati fell.

Spotting Religious Influences in Ancient Architectural Design-Indian Temple Architecture



Religion has always been an expressive element in any given architectural movement throughout the world. The evolution of ancient architecture in the Indian subcontinent is the most vivid example of how changes in the

politico-religious landscape can shape structures and its surroundings. Conquest, growth, and decay of kingdoms or civilizations (great or small) triggered a unique evolution (or cross-over, if you may) in the existing modules of the architecture of that period.

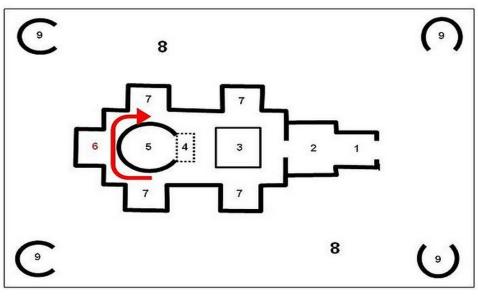
This article intends to explore the ways religion and regional events affected ancient Indian architecture as we see it today. It would mean that we would jump across periods as we explore some important structures individually, exploring the stylistic and location-based choices made during the construction of the same.

Hinduism is the religion around which the majority of our architecture is centered. We had distinct styles of temple architecture, which depended on the region of India they belonged in. We are aware of the basic planning of Hindu temples, namely –

- 1) Ardha-Mandapa (entrance porch)
- 2) Mandapa (hall)
- 3) Antaraala (vestibule)
- 4) Garbha-Griha (Sanctum Sanctorum)
- 5) Pradakshina (concentric passage surrounding Garbha-Griha or circumambulation)

These planning principles of Hindu temples originally evolved from the Stupa of Sanchi, a Buddhist temple. Buddhism branched from Hinduism, which practices in moderation. Both religions hold similar thought processes towards ways of life, meditation, and attaining Nirvana/Moksha through consistent devotion.

The Stupa is one big dome within which Buddha's remains/scriptures are placed at its center. Around this Stupa, a circumambulation is provided for devotees for circling for 108 times, as they chant away their mantras. The engravings of flora and fauna were also found on the gates of Stupa. These intricate sculptings and planning principles kicked off a new trend in Hindu Temple from that point.



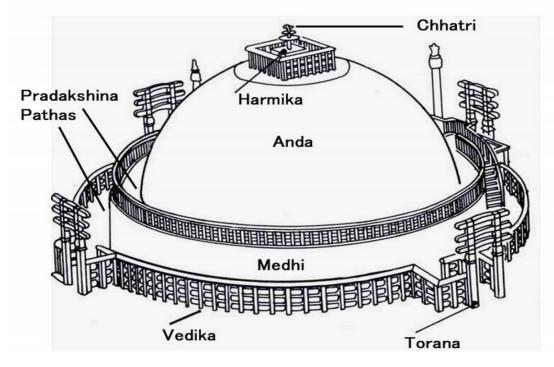
- 1. Ardha mandapa
- 2. Mandapa
- 3. Maha mandapa
- 4. Antarala
- 5. Garba griha

- 6. Pradakshina
- 7. Transepts
- 8. Jagati
- 9. Subsidiary shrines

Plan of Kandariya Mahadeva Temple

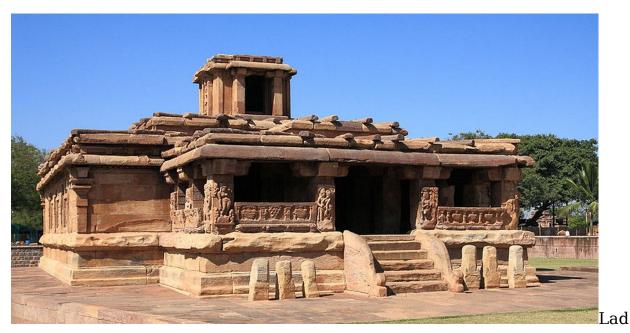
Basic Planning Principles of Hindu Temple ©en.wikipedia.org

Plan of a Stupa with two pradakshinapathas



Parts of Stupa ©www.clearias.com

Some of the earliest experiments of temple designs used simple forms and techniques. Taking an example, Lad Khan Temple (5th Century, Aihole, Karnataka) set the basics in planning principles of Dravidian temple architecture. Some characteristics, like using sculptural motifs from various ancient scriptures, were derived from the Stupa of Sanchi. Shikhara (a pyramid-like vertical) mounted over Garbha-Griha was derived from the Anda (the dome) of Stupa and Chhatras mounted atop. This temple has a square plan but the entrance is rectangular, which became the beginning of 'Ardha-Mandapa and Mandapa' concept as well. Later on, the same Ardha-Mandapa evolved into gopuram, an entry tower functioning like a marker for places of worship. Unlike the carved monolithic temples in Mahabalipuram, this temple was constructed manually by mimicking a wooden structure and using stone masonry.



Khan Temple ©commons.wikimedia.org

Mundeshwari Temple follows nearly the same pattern, which is the earliest temple of Nagara architectural style. However, the Nagara style commands the entire 5 containments (Panchayatna) around the Sanctum Sanctorum. This configuration is seen in ancient temples throughout all regions of India, except in the South.

The first intra-religious influence over ancient architecture was based on what God's people worshipped. Temples like Lad Khan Temple, Padmanabhaswamy Temple, Bhadrachalam Temple, etc, had square/rectangular shaped Kalasha (present at the tip of the Shikhara), identified as Vaishnavite temples (temples holding Lord Shiva



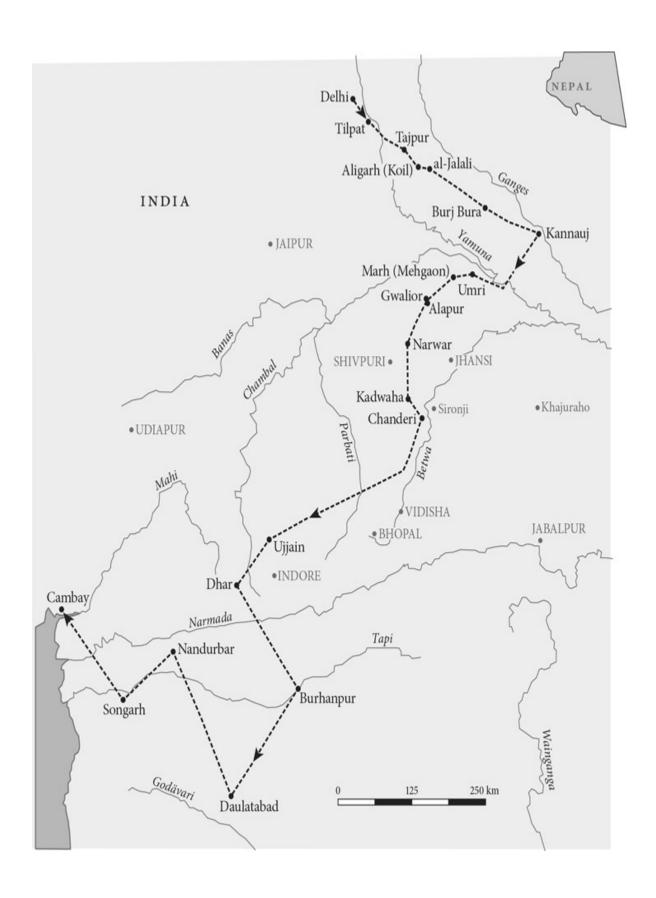
hwari Devi Temple, Bihar ©en.wikipedia.org

within Its shrine). Shaivite temples (temples holding Lord Shiva within Its shrine) on the other hand, have circular-shaped Kalasha. Some of the prime examples are Shore Temple (700 AD, Mahabalipuram, Tamilnadu), Bhimashankar Temple (13th century, Pune, Maharashtra), and Kandariya Mahadev Temple (c. 1003 CE, Khajuraho, Madhya Pradesh).



Trayambakeshwar Temple, a Shaivite Temple (Nashik) ©en.wikipedia.org

https://www.re-thinkingthefuture.com/fresh-perspectives/a1320-spotting-religious-influences-in-ancient-architectural-design-indian-temple-architecture/



CHAPTER III Brahmanical Skies over the Angkor Kingdoms Part I



A Khatriya from India and Suryavarman II (RIGHT)

Dr. Uday Dokras

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Introduction: In this Dulogy of which this is the first pat we describe how the kings of Khemer took upon themselves the role of Brahmins inspite of having on connect with the Indus- Valley Civilization but on the basis of staunch Hinduism they embraced which is far remote from the concept of a king in Hindu areas of Bharat where Kings were Ksatriyas and Brahmins handled religious matters with no superiority.

Brahman, the Universal Intellect

The hymn *Purusha Sukta* to the *Rigveda* describes the symbolic creation of the four varna-s through cosmic sacrifice (yajña). Some scholars consider the *Purusha Sukta* to be a late interpolation into the *Rigveda* based on the

neological character of the composition, as compared to the more archaic style of the Vedic literature. Since not all Indians were fully regulated under the varna in the Vedic society- the *Purusha Sukta* was supposedly composed in order to secure Vedic sanction for the heredity caste scheme. An alternate explanation is that the word 'Shudra' does not occur anywhere else in the *Rig-veda* except the *Purusha Sukta*, leading some scholars to believe the *Purusha Sukta* was a composition of the later Rig-vedic period itself to denote, legitimize and sanctify an oppressive and exploitative class structure that had already come into existence.

Although the Purusha Sukta uses the term rajanya, not Kshatriya, it is considered the first instance in the extant Vedic texts where four social classes are mentioned for the first time together. Usage of the term Rajanya possibly indicates the 'kinsmen of the Rajan' (i.e., kinsmen of the ruler) had emerged as a distinct social group then, such that by the end period, the term *rajanya* was replaced by Kshatriva: of the Vedic where rajanya stresses kinship with the Rajan and Kshatriya denotes power over a specific domain. The term rajanya unlike the word Kshatriya essentially denoted the status within a lineage. Whereas Kshatra, means order". Based "rulina: of the rulina one on the authority of Pāṇini, Patanjali, Kātyāyana and the *Mahabharata*, -Rajanya was the name of political people and that the Rajanyas were, therefore, a democracy (with an elected ruler). Some examples were the Andhaka and Vrsni Rajanyas who followed the system of elected rulers. The central chief was elected by various clan chiefs or lineage chiefs with increasing polarisation between the rajanya (aristocracy helping the ruler) and the vis (peasants) leading to a distinction between the chiefs as a separate class (raja, rajanya, kshatra, kshatriya) on one hand and vis (clan peasantry) on the other hand.



The **term kshatriya** comes from *kshatra* and implies temporal authority and power which was based less on being a successful leader in battle and more on the tangible power of laying claim to sovereignty over a territory, and symbolising ownership over clan lands. This later gave rise to the idea of

kingship. The Srimad Bhagavata Gita has the following quoted lines by Sri Krishna:

Kshatriya never flees from the war, he shows bravery, skill, chivalry and patience in the face of war. Donation to the society and protecting citizens (Kshatra duty) are the norms of a Kshatriya.

In the period of the Brahmanas (800 BCE to 700 BCE) there was ambiguity in the position of the varna. In the *Panchavimsha Brahmana* (13,4,7), the Rajanya are placed first, followed by Brahmana then Vaishya. In *Shatapatha Brahmana* 13.8.3.11, the Kshatriya are placed second. In *Shatapatha Brahmana* 1.1.4.12 the order is—Brahmana, Vaishya, Rajanya, Shudra. The order of the brahmanical tradition—Brahmana, Kshatriya, Vaishya, Shudra—became fixed from the time of dharmasutras (450 BCE to 100 BCE). The kshatriya were often considered pre-eminent in Buddhist circles Even among Hindu societies they were sometimes at rivalry with the Brahmins, but they generally acknowledged the superiority of the priestly class. The Kshatriyas also began to question the yajnas of the historical Vedic religion, which led to religious ideas developed in the Upanishads.

Mahajanapadas

The gaṇa sangha form of government was a oligarchic republic during the period of the Mahajanapadas (c. 600-300 BCE), that was ruled by Kshatriya clans. However, these kshatriyas did not follow the Vedic religion, and were sometimes called degenerate Kshatriyas or Shudras by Brahmanical sources. The kshatriyas served as representatives in the assembly at the capital, debated various issues put before the assembly. Due to the lack of patronage of Vedic Brahmanism, the kshatriyas of the gana sanghas were often patrons of Buddhism and Jainism.

In the kingdoms of the Mahajanapadas, the king claimed kshatriya status through the Vedic religion. While kings claimed to be kshatriya, some kings came from non-kshatriya origins.

After the Mahajanapada period, most of the prominent royal dynasties in northern India were not kshatriyas. The Nanda Empire, whose rulers were stated to be shudras, destroyed many kshatriya lineages.

The Sdok Kak Thom Inscription in Thailand: The inscription (classified K. 235) is a 340-line composition, in both Sanskrit and ancient Khmer, carved on a gray sandstone stele 1.51 meters high that stood in the northeast corner of the temple's court. Dating to 8 February 1053, it recounts two and a half centuries of service that members of the temple's founding family provided to the Khmer court, mainly as chief chaplains to kings. In laying out this long role, the text provides a remarkable and often poetically worded look at the faith, royal lineage, history and social structure of the times.



Northeastern library. Photo c. 1980 / The Inscription RIGHT PIC

The Sanskrit text opens: "Homage to Śiva whose essence is highly proclaimed without words by the subtle Siva, His form, who pervades (everything) from within and who activates the senses of living beings."[2] The inscription is perhaps most useful to historians in providing an account of twelve Khmer kings who ruled over the course of the two and a half centuries. It recounts monarchs' spiritual and martial virtues and basic events of their reigns. "As a teacher zealously impels his disciples or a father his children, so did he, for the sake of his duty, zealously impel his subjects, rightfully securing them protection and nourishment," says the inscription of Udayādityavarman II. "In battle he held a sword which became red with the blood of the shattered enemy kings and spread on all sides its rising lustre, as if it were a red lotus come out of its chalice [or, applied to the sword: drawn out of its scabbard], which he had delightedly seized from the Fortune of war by holding her by the hair(or better, correcting laksmyāḥ in to laksmyā: which the Fortune of war, after he had seized her hair, had delightedly offered him)."

The earliest king mentioned is Jayavarman II, who historians generally consider, partly on the authority of this inscription, to have founded the Khmer empire in c. 800. The text includes the oft-cited detail that he came from a country named Java which meanwhile by most scholars, such as Charles Higham, was seen as a foreign people living in the east whose name is derived probably from Sanskrit yavana (wise), perhaps referring to the kingdom of Champa. The Khmer portion of the text goes on to say: "A Brahman named Hiraṇyadāman, skilled in magic and science," was invited by the king "to perform a ceremony that would make it impossible for this country of the Kambuja to pay any allegiance to Java and that there should be, in this country, one sole sovereign."

The inscription documents nine generations of the temple's priestly family starting with Śivakaivalya, Jayavarman II's chaplain. The advisors are praised in the same adulatory tone as is employed for the kings. The text gives a detailed account of how the family systematically expanded

its holdings of land and other property over the course of its long relationship with the royal household. The final chaplain named in the text, Sadasiva, is recorded as leaving the holy orders and marrying a sister of the primary queen of Suryavarman. The man was given a new name and placed in charge of construction projects. His career appears to have closed out the family's role in the royal inner circle; the family is never heard from again in inscriptions.

Devaraja Cult: Scholars have paid special attention to the inscription's account of the cult of the devarāja, a key part of the Khmer court's religious ritual. "Hiranyadāma(n), the best of brahmins, with superior intelligence like Brahmā, came, moved with compassion. To the king Jayavarman II he carefully revealed a magic which had not been obtained by other people," the text reads. The king was instructed in four holy treatises. "After carefully extracting the quintessence of the treatises by his experience and understanding of the mysteries, this brahmin contrived the magic rites bearing the name of Devarāja, for increasing the prosperity of the world." [7] But the description is sufficiently enigmatic that scholars cannot agree on the cult's function. The term means obviously "king of the gods," in the sense that one god, generally Siva, was recognized as higher than others in the Hindu pantheon and through his authority brought order to heaven. Court religious ritual, as described repeatedly in the inscription, focused on maintaining a linga, or holy shaft, in which Siva's essence was believed to reside.

The inscription is also key to understanding important events in Khmer history, such as the late 9th Century relocation of the capital from the area around the present-day village of Roluos. "Again, the skillful Vāmaśiva was the preceptor of Śrī Yaśovardhana, bearing as king the name Śrī Yaśovarman," the Sanskrit text states. "Invited by the king, he erected a linga Mount Yaśodhara, which was like the king of mountains (Meru) in beauty." French scholars initially believed that Śrī Yaśodharagiri was the mountain-like Bayon temple. But it is now established that the Bayon was built almost three centuries later than the event described in the inscription and that the linga was in fact placed in the newly constructed Phnom Bakheng temple, which stands about two kilometers south of the Bayon atop a real hill.

The text also notes the relocation of the capital from Angkor to the site now known as Koh Ker under Jayavarman IV, and turmoil during the times of King Sūryavarman I. He is described as having dispatched soldiers against people who had desecrated shrines in the area of Sdok Kok Thom. Historians generally believe that Sūryavarman fought his way to power, eventually driving out of Angkor a king named Jayavīravarman (who significantly is not mentioned in the inscription).

Elsewhere, the text provides myriad details of everyday existence in the empire. Khmer inscriptions were created in part to glorify heaven and the

earthly elite. For that reason, their value as factual records is often thrown into question. Overall, there is general consensus among scholars that the words chiseled out at Sdok Kok Thom are perhaps the most important written explanation that the Khmer empire provided of itself.

The inscription's author or authors are not named. Many scholars conclude firmly that Sadasiva wrote it, at least his lineage; Sak-Humphry believes the text was likely drafted in consultation with the Brahman, but was meant to represent declarations of his king, Udayādityavarman II.¹

In "India" (of those days) as well as SE Asis, the devarāja order grew out of both Sanatana Dharma and separate local traditions depending on the area. It taught that the king was a divine universal ruler, a manifestation of Shri Bhagawan (often attributed to Shiva or Vishnu). The concept viewed the monarch to possess transcendental quality, the king as the living god on related earth. The concept is closely to the Bharati concept of Chakravartin (universal monarch). In politics, it is viewed as the divine justification of a king's rule. The concept was institutionalized and gained its elaborate manifestations in ancient Java and Cambodia, where monuments such as Prambanan and Angkor Wat were erected to celebrate the king's divine rule on earth.

The devaraja concept of divine right of kings was adopted by the indianised Hindu-Buddhist kingdoms of Southeast Asia through Indian Hindu Brahmins scholars deployed in the courts. It was first adopted by Javanese kings and through them by various Malay kingdoms, then by the Khmer empire, and subsequently by the Thai monarchies.

Purpose

The Devaraja concept has been established through rituals and institutionalized within the Indianized kingdoms of Southeast Asia. It enables the monarch to claim the divine authority which could be used on ensuring political legitimacy, managing social order, economic and religious aspects. In political aspects, it strengthens the justification of the king and the ruling dynasty as the rightful ruler of the land. It also used to maintain social order, exalting the king as living god definitely demands the utmost service and devotion of his people. Introducing the Indian caste system also defining social class, occupations, as well as the way of life of their people.

The Devaraja religious order also enabled the king to embark on large scale public works and grand projects, by mobilizing their people to create and maintain elaborate hydraulic irrigation system to support large scale rice agriculture or to construct imposing grand monuments and temples in the king's honor. The example of this grand projects are Borobudur, Prambanan, also temples and barays in Angkor.

Ritual

Example of the Devaraja religious order — such as demonstrated by Jayavarman II — associate the king with the Hindu deity Sri Shiva, whose divine essence was physically embodied by the linga (or lingam), a phallic idol housed in a mountain temple. The king was deified in an elaborate and mystical ceremony, requiring a high priest, in which the divine essence of kingship was conferred on the ruler through the agency of the linga. The safeguarding of the linga became bound up with the security of the kingdom, and the great temple architecture of the Khmer period attests to the importance attached to the belief.

Adoptation of the Devaraja on Indian Subcontinent by Tamil kings of the *Chola dynasty*

In Dravidian culture, before Brahmanism and especially during the Sangam period, emperors were known as \(\bigcup_{\text{\tex

Brahmins on the other hand were the carriers of the religious texts and rituals. In the Vedic era thrived from 1500 BCE to 500 BCE in northern India on both sides of the Indus river. The Indus valley was civilised by the Aryans – the 'noble' ones – who worshipped nature. The Vedas originally believed in the concept of Sanatana Dharma (eternal order of life) where nature was worshipped with rituals and praise, which supposedly forms a significant part of the Vedas. The Vedas originated the ideology of Brahman, which became the central theme of those following the Vedas and its principles.

Brahmanism is the central theme and belief of Vedic followers, its thoughts and philosophical concept giving rise to the primary and socio-religious belief and conduct in Hinduism. It has got its name from the Brahmans, who performed the Vedic rituals. One can say that Brahmanism is an ideology originating from the history of the Vedas, often called a philosophy, practised on the basis of specific inferred beliefs. The fundamental and principle belief of Brahmanism defines God Brahman of the Trimurthy the triad of Gods consisting of Brahma the creator, Vishnu the preserver, and Shiva the d estroyer as the three highest manifestations of the one ultimate reality and its attribute less element that was first captured by the Rishis who compiled the Vedas. "That which existed before creation, that which constitutes the existent whole, and that into which all creation dissolves is the all-pervading

Brahman, and the cycle of creation, sustenance, and destruction of the universe is endless." (Kena Upanishad).²

The origin of this form of Hinduism is lost in antiquity, but it is probable that it represents a pre-Aryan religion, more or less modified in various parts of south India by Brahmanical influence. The Kūrma Purana (1.9) tells a Hindu story of creation, summarised here;

Source of wisdom and authority

What does it mean?

"Brahma and Vishnu together killed the demons that wanted to sabotage the creation of the universe. After being frustrated in his creative work, Brahma cried, and died, but then Shiva was born from Brahma - who revived. Shiva lived in all trimurti in the making of of the elements, including the sun, water, sky, fire, the universe. wind and trees."

This creation story emphasises the role of each of the gods of the

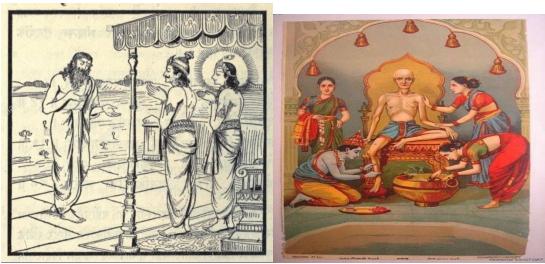
Source of wisdom and authority

What does it mean?

"Brahma decided to start creation afresh but discovered that the earth was submerged in water. How would his creations survive if there was no earth? He therefore requested Vishnu to bring up the Purana 1.6)"

There are many Hindu scriptures that tell creation stories. This short extract narrates the making of the universe and shows that two of the trimurti gods played cooperative parts. Brahma as creator led this process. earth from under the water. (Kūrma but Vishnu used his power in the creation as well.

Now, it was precisely in the Southern part of India that mainly arose the body of literature which records the gradual rise of the Brahmanical hierarchy and the early evelopment of the castesystem. For many centuries the culture and development of the Hindus depended mainly on the interaction of the old Brahmanical religion and Buddhism.



Krishna receives the Brahmin

Passing to later times, we can watch a theory of monotheism rising, and dying down again, during what our scholars distinguish as the Brahmanical period of Indian religion. The higher castes murmured, and many of them left him, for he taught that the Brahmanical threads must be broken; but the lower orders rejoiced and flocked in numbers to his standard.

The origin of this kingdom, famous alike in the political and religious history of India, is lost in the mists of antiquity; and though the Brahmanical Puranas give lists of its rulers extending back to remote ages before the Christian era, the first authentic dynasty is that of the Saisunaga, founded by Sisunaga (c. 600 B.C.), whose capital was at Rajagaha (Rajgir) in the hills near Gaya; and the first king of this dynasty of whom anything is known was Bimbisara (c. 528 B.C.), who by conquests and matrimonial alliances laid the foundations of the greatness of the kingdom.

Α development of Brahmanism. is the formulation the Brahmanical creed. That the theory of the triple manifestation of the deity was indeed only a compromise between Brahmanical aspirations and popular worship, probably largely influenced by the traditional sanctity of the number three, is sufficiently clear from the fact that, whilst Brahma, the creator, and at the same time the very embodiment of Brahmanical class pride, has practically remained a mere figurehead in the actual worship of the people, Siva, on the other hand, so far from being merely the destroyer, is also the unmistakable representative of generative and reproductive power in nature.

Under these conditions the religious practices of the lower race tended to gradually draw the lower race more or less under the influence of the Brahmanical forms of worship, and thus contributed towards the shaping of the religious system of modern Hinduism. In the epic poems which may be

assumed to have taken their final shape in the early centuries before and after the Christian era, their popular character- the Brahmanical triad, appears in full force.

The Indian devraja who was a Brahmin as well as a King: We have in the introduction cvcvunderlined the Devraja concept which was not very popular in India but took greater root in Indo China. In the reign of the Indian Pushyamitra, who held his own against Menander and succeeded in establishing his claim to be lord paramount of northern India, is mainly remarkable as marking the beginning of the Brahmanical reaction and the decline of Buddhism; according to certain Buddhist writers the king, besides reviving Hindu rites, indulged in a savage persecution of the monks.

The most obvious characteristics of the ordinary Hindu are that he worships a plurality of gods, looks upon the cow as a sacred animal, and accepts the Brahmanical supremacy (see Brahmanism) and the caste system; and when it is a question whether one of the animistic tribes has or has not entered the fold of Hinduism, these two latter points seem to be the proper test to apply.

Brahmanism is the central theme and belief of Vedic followers, its thoughts and philosophical concept giving rise to the primary and socio-religious belief and conduct in Hinduism- a predecessor of Hinduism. Since the inference and perception of Brahman were put forward by the Rishis, the ones who later became staunch followers of Brahmanism, they were considered, according to some, to be of priestly caste and were called Brahmans.

They duplicated the ideology through teachings and performance of rituals, and thus Brahmanism came to be practised with vigour and unwavering determination. Brahmanism, as some researchers claim, is also said to have got its name from the Brahmans, who performed the Vedic rituals.

Moreover, a Brahman priest is the one who is always engrossed in the thoughts of the eternal Brahman. Brahmanism, nevertheless, remains the most sought after ideology which baffles the interpretation abilities of the wisest preceptors and superior scholars and to this day remains an exhaustless mystery.

Core Concepts of Brahmanism

The core concepts of Brahmanism are significantly aligned with metaphysics, questioning what is actually real, the validity of time, of being, of consciousness, and the origin and basis of all existence. Many scholars, such as archaeologists, geologists, Indologists, and philologists, have taken refuge in the writings of the Vedas, especially in the concept of Brahman since it is directly related to humans and their origin.

Influence & Interpretations

Brahmanism's famous but most ingrained influence is seen on Hinduism, in the sense and to the extent that Hindus do not distinguish between Brahmanism and Hinduism. Brahmins, a priestly caste privileged to practise the Vedic rituals are the carriers of the performance-based implementation of the ideology. They perform rituals and sacrifices described in the Vedas, including worship and praise of the forces of nature. Brahmanism today is a belief system well-researched among cosmologists trying to decipher the complexity of the universe and its likely origin.³

The concept of devaraja or God King was the ancient Cambodian state religion, but it probably originated in Java where the Hindu influence first reached Southeast Asia. Circa 8th century, Sailendras allegedly ruled over Java, Sumatra, the Malay Peninsula and parts of Cambodia. In ancient Java, since Sailendra dynasty. The devaraja concept is believed to be introduced to Java in 732, when king Sanjaya installed a linga to consecrate a new Mataram Dynasty, as stated in Canggal inscription, thus the king seek Shiva's protection of his rule.

Even older Tarumanagara kingdom, the state religion regarded the king as god incarnated on earth. The Tarumanagara fifth century CE Ciaruteun inscription, inscribed with king's sole print, regarded King Purnawarman as incarnation of Vishnu on earth. The Kebon Kopi I inscription, also called *Telapak Gajah* stone, with an inscription and the engraving of two large elephant footprints, associated king's elephant ride as Airavata (elephant ride of God Indra), thus associated the king also with Indra.

In Medang kingdom in Central Java, it is customary to erect candi (temple) to honor and sent the soul of a dead king. The image of god inside the garbhagriha (central chamber) of the temple often portraved the deceased king as a god, as the soul of the dead king finally united with the revered god in svargaloka. Some archaeologists propose that the statue of Shiva in the garbhagriha of Prambanan main temple was modelled after King Balitung, serving as a depiction of his posthumous deified self. It is the fusion that the concept was of Hinduism native Austronesian ancestor worship. The 11th century king Airlangga of Kahuripan in East Java, was deified posthumously as Vishnu in Belahan temple. In Java, the tradition of divine king continued well to Kediri, Singhasari, and Majapahit kingdom in the 15th century.

After the coming of Islam in the archipelago and the fall of Majapahit, the concept of God-King were most likely ceased to exist in Java, since Islam rejects the concept of divinity in mortal human being. Yet the concept survived in traditional Javanese mysticism of Kejawen as wahyu, suggesting that every king and rulers in Java was bestowed wahyu, a divine authority

and mandate from God.^[21] A heavenly mandate that could be revoked and transferred by God, to explain the change of dynasty in Java during Demak, Mataram Sultanate era, well to the succession of the president of Indonesia.

Cambodia and Khmer empire



The concept of Devaraja enabled Khmer kings to embark on grand-scale project, such as to build Angkor Wat.

In ancient Cambodia, devarāja is recognized as the state's institutionalized religion. The Cambodian the concept of the "god-king" is believed to be established early in the 9th century by Jayavarman II, founder of the Khmer empire of Angkor, with the brahmin scholar Sivakaivalya as his first chief priest at Mahendraparvata. For centuries, the concept provided the religious basis of the royal authority of the Khmer kings.

In a Khmer context the term was used in the latter sense as "god-king", but occurs only in the Sanskrit portion of the inscription K. 235 from Sdok Kak Thom / Sdok Kăk Thom (in modern Thailand) dated 8 February 1053 CE, referring to the Khmer term *kamrateń jagat ta rāja* ("Lord of the Universe who is King") describing the protective deity of the Khmer Empire, a distinctly Khmer deity, which was mentioned before in the inscription K. 682 of Chok Gargyar (Kòh Ker) dated 921/22 CE.

In the Sdok Kăk Thoṃ inscription a member of a brahmin family claimed that his ancestors since the time of Jayavarman II (Khmer: \(\limin \) \(\limin \) \(\limin \) \(\limin \) who established around 800 CE by marriage to the daughter of a local king in the Angkor region a small realm which became at the end of the 9th century the famous Khmer Empire, were responsible for the concept of the Devarāja (kamrateṅ jagat ta rāja). Historians formerly dated his reign as running from 802 CE to 850 CE, but these dates are of very late origin (11th century) and without any historical basis. Some scholars now have tried to identify Jayavarman II with Jayavarman Ibis who is known from his inscriptions from Práḥ Thất Práḥ Srěi south of Kompon Čàṃ (K. 103, dated 20 April 770) and from Lobo'k Srót in the vicinity of Kračèḥ close to the ancient town of Śambhupura (K. 134, dated 781 CE). The Sdok Kak Thoṃ inscription incised c. 250 years after the events (of which their historicity is doubtful) recounts that on the top of the Kulen Hills, Jayavarman II instructed a brahmin priest

Coedes states, "...in southern India, Mount Mahendra was considered the residence of Siva as king of all gods (*devaraja*), including Indra Devaraja, and as sovereign of the country where the mountain stands. The ritual of the Devaraja established by the brahmin Hiranydama was based on four texts - *Vinasikha*, *Nayottara*, *Sammoha*, and *Siraccheda*...the four faces of Tumburu. These Tantras "were supposed to have been uttered by the four mouths of Siva represented by the gandharva Tumburu." He goes on to state, "In the Indianized kingdoms of Southeast Asia, the Hindu cults...eventually became royal cults. The essence of royalty...was supposed to reside in a linga...obtained from Siva through a brahmin who delivered it to the king...the communion between the king and the god through the medium of a priest took place on the sacred mountain."

Khmer emperor Jayavarman II is widely regarded as the king that set the foundation of the Angkor period in Cambodian history, beginning with the grandiose consecration ritual conducted by Jayavarman II (reign 790-835) in 802 on sacred Mount Mahendraparvata, now known as Phnom Kulen, to celebrate the independence of Kambuja from Javanese dominion (presumably the "neighboring Chams", or chvea). At that ceremony Prince lavavarman II was proclaimed a universal monarch (Kamraten jagad ta Raja in Cambodian) or God King (Deva Raja in Sanskrit). According to some sources, Javavarman II had resided for some time in Java during the reign of Sailendras, or "The Lords of Mountains", hence the concept of Devaraja or God King was ostensibly imported from Java. At that time, Sailendras allegedly ruled over Java, Sumatra, the Malay Peninsula and parts of Cambodia. An inscription from the Sdok Kak Thom temple recounts that at part Mahendraparvata, Jayavarman Ш took in the Brahman Hiranyadama, and his chief priest Lord Sivakaivalya, known as devaraja which placed him as a *chakravartin*, Lord of the Universe.

Today, the tradition of public reverence to the King of Cambodia is said to be the continuation of this ancient concept of devaraja, and is mistakenly said of the King of Thailand.

Monarch of Thailand as the Devaraja

This concept of "" (Thai: [[]][[]][]]]) (or "divine king") was adopted by the Thai kings from the ancient Khmer tradition of devaraja followed in the region, and the Hindu concept of kingship was applied to the status of the Thai king. The concept centered on the idea that the king was an incarnation (avatar) of the god Vishnu and that he was a Bodhisattva (enlightened one), therefore basing his power on his religious power, his moral power, and his purity of blood.

Brahmins took charge in the royal coronation. The king was treated as a reincarnation of Hindu gods. Ayutthaya historical documents show the official titles of the kings in great variation: Indra, Shiva and Vishnu, or Rama. Seemingly, Rama was the most popular, as in "Ramathibodhi". However, Buddhist influence was also evident, as many times the king's title and "unofficial" name "Dhammaraja", an abbreviation of the Buddhist Dharmaraja. The two former concepts were re-established, with a third, older concept taking hold.

The king, portrayed by state interests as a semi-divine figure, then became—through a rigid cultural implementation—an object of worship and veneration to his people. From then on the monarchy was largely removed from the people and continued under a system of absolute rule. Living in palaces designed after Mount Meru ("home of the gods" in Hinduism), the kings turned themselves into a "Chakravartin", where the king became an absolute and universal lord of his realm. Kings demanded that the universe be envisioned as revolving around them, and expressed their powers through elaborate rituals and ceremonies. For four centuries these kings ruled Ayutthaya, presiding over some of the greatest period of cultural, economic, and military growth in Thai History.

History of Indian influence on Southeast Asia, Indian influences in early Philippine polities, Greater India, Mandala, and Indianisation

Annals, the rajas and sultans of the Malay the Malay (today Malaysia, Brunei and Philippines) as well as their predecessors, such as the Indonesian kingdom of Majapahit, also claimed divine right to rule. The sultan is mandated by God and thus is expected to lead his country and people in religious matters, ceremonies as well as prayers. This divine right is called Daulat (which means 'state' in Arabic), and although the notion of divine right is somewhat obsolete, it is still found in the phrase Daulat Tuanku that is used to publicly acclaim the reigning Yang di-Pertuan Agong and the other sultans of Malaysia. The exclamation is similar to the European "Long live the King", and often accompanies pictures of the reigning monarch and his consort on banners during royal occasions. In Indonesia, especially on the island of Java, the sultan's divine right is more commonly known as the way, or 'revelation', but it is not hereditary and can be passed on to distant relatives.⁴

It is claimed that two concerns czn be raised on the degree to which the Indian caste system can be, or has been, exported from India to Cambodia in ancient times.

- 1.) d not concern themselves with possessing religious or ritual authority; whereas in Indochina, they formally possessed religious as well as political prerogatives.
- 2.) In Indo China, Kings were "oriental Despots" with a great degree of control over social organization, by virtue of their ritual position bringing about social engineering.

The rulers of the Khmer Empire:

The rulers of the Khmer Empire were those who run the empire and ruled Angkor. They were known as Kings but later they began to be known as Emperors. To become an Emperor you had to be born into the monarchy, usually the Emperor's eldest son was next in line but on the rare occasion where the Emperor didn't have any children, the next in line was the Emperors next eldest brother or their next eldest nephew. In Angkor, Emperors were worshipped as if they were chosen and sent from the gods. They were viewed as if they were the re-incarnated god Shiva, the god of masculinity.

Nobles and Officials:

During the time of the Khmer Empire nobles and officials were very important people. They were the second in charge, only answerable to the King himself. They were the people who were given instructions from the King and then had to pass this onto the ordinary people. They also held the job of making decisions and very often would help the King with the big decisions he had to make. The nobles each owned sections of the land and were in charge of those who lived on their land. The ordinary people which lived on their land produced crops for the nobles, officials and the King, which was their way of paying to stay on the nobles land. The officials were usualy relatives of the King, they were the people that guarded the lands. The nobles and officials lives

Numbe	Name of King	Reign	
r			
1	Jayavarman II	802-835	
2	Jayavarman III	835-877	
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onto the ordinary people. They also held the job of making decisions and very often sections of the land and were in charge of those who lived on their land. The ordinary which was their way of paying to stay on the nobles land. The officials were usualy officials lives were spent based around the running of the Empire and, compared to the

What life was like for Women in the Khmer Society:

The women of the Khmer Empire were treated no differently to the men, if anything the produce at stalls, as there were no shops. The women sold anything from fish and veg goods that they had produced themselves. The women also looked after the children and gave them education on what they knew. It is said that the prettier women of the time were taken into the palace to serve for the King or his royal family. Women and men, both used to wear the same thing, fabric strips covering from their waist down. The women of the Khmer empire were workers and worked for what they owned, but they were also treated poorly by some men in the society as if they were their own slaves to boss around.

However for the ordinary people of Khmer, life was rough as they had to scavenge and hunt for food, and then sell it to make profits. The ordinary people were broken up into groups and peasants, artisans, fisherman, traders, slaves and outsiders. Each of them played their own roll in surviving in the Khmer Empire.⁵









Artisans Of Khmer, RIGHT The Noblemen

Here are 2 examples: Divākarapaṇḍita, original name Divākara, (born 1040, Cambodia—died c. 1120), Hindu of the Brahman (priestly) caste who rose through religious and administrative ranks to serve four Cambodian kings—Harshavarman II, Jayavarman VI, Dharanindravarman I, and the great Suryavarman II—and who was the most trusted adviser to three of them.

The highly opportunistic Divākara was able not only to survive the successive usurpations of monarchies but also to ingratiate himself with each new sovereign. Divākarapaṇḍita played a singular role in Cambodian history, for it was at his urging that Suryavarman II began construction of the temple of Angkor Wat, one of the world's largest religious edifices and certainly one of the greatest achievements of ancient Khmer, or Cambodian, civilization. One of the monuments of Angkor Wat commemorates this powerful Brahman.

Paramavishnuloka: Similarly,Inscriptional evidence suggests that Suryavarman II died between 1145 AD and 1150 AD, possibly during a military campaign against Champa, before that, his troops was defeated by Vietnamese troops led by Tô Hiến Thành. Suryavarman was given the posthumous name Paramavishnuloka, He Who Has Entered the Heavenly World of Vishnu. Angkor Wat appears to have been completed only after his death



A modern sculpture that adapts his court image in the Angkor Wat bas reliefs today greets visitors arriving at the Siem Reap airport. Parasols shelter this image of the king, as they did the real Suryavarman almost nine centuries ago.

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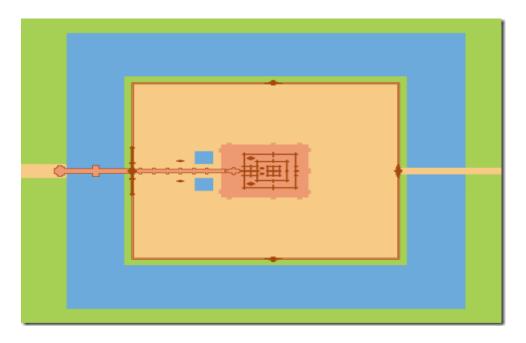
CHAPTER IV Brahmanical Skies over the Angkor ARCHITECTURE



This is a classic view, with three symmetrical towers rising from the building. There are really five, but two are obscured, behind the towers on the left and right.

Introduction: In this Dulogy of which this is the first pat we describe how the kings of Khemer took upon themselves the role of Brahmins Inspite of having on connect with the Indus- Valley Civilization but on the basis of staunch Hinduism they embraced which is far remote from the concept of a king in Hindu areas of Bharat where Kings were Ksatriyas and Brahmins handled religious matters with no superiority.

The major ancient Angkor temples were built in locations according to the location of stars in the constellation Draco, the dragon. In Cambodia this is seen as a Naga, a divine cobra. The Cambodians trace their origins back to the Naga, so it seems fitting that they think these temples were built according to the stars of Draco. In Cambodian mythology, the Princess of the Nagas married an Indian Brahmana and from that union was born the Cambodian people. Therefore still Cambodians say that they are "Born from the Naga." Here is the layout of Angkor Wat. It stands within a wide moat and has an outer wall 3.6 km (2.2 mi) long. The entrance is from the west, the left on the diagram below.



The western gate tower seems broken at the top. The crowd of people at the entrance is typical of Angkor Wat. This is THE place where almost every person who visits Cambodia will tour during their visit. Religious buildings often have designs based on military defensive strategy. Even a modern Christian church built in the shape of a cross is a defensible structure.

This is because, at some stage in its history, every religious following fears persecution. This is obvious with Angkor Wat; it''s a walled city with it's own water supply and protected farmlands.

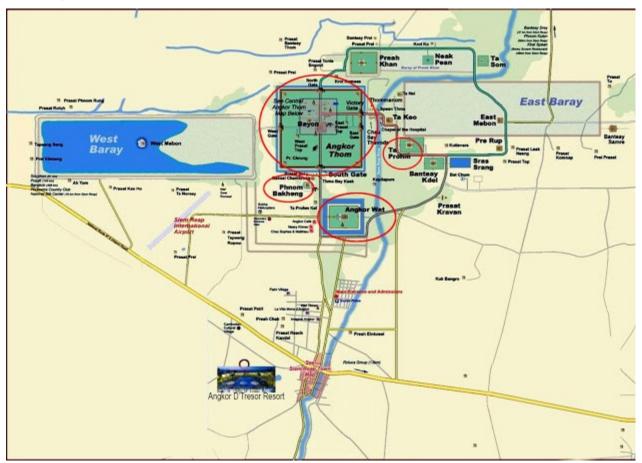
In the field of architecture an **architectural plan** is a design and planning for a building, and can contain architectural drawings, specifications of the design, calculations, time planning of the building process, and other documentation.

The term "architectural plan" can have multiple related meanings:

- plan for an architectural project
- documentation of written and graphic descriptions of the architectural elements of a building project including sketches, drawings and details. This effort could also include both the design of new buildings and other structures, as well as the planning for reconstruction of early historic structures.
- architectural design
- floor plan
- scale drawing of a structure

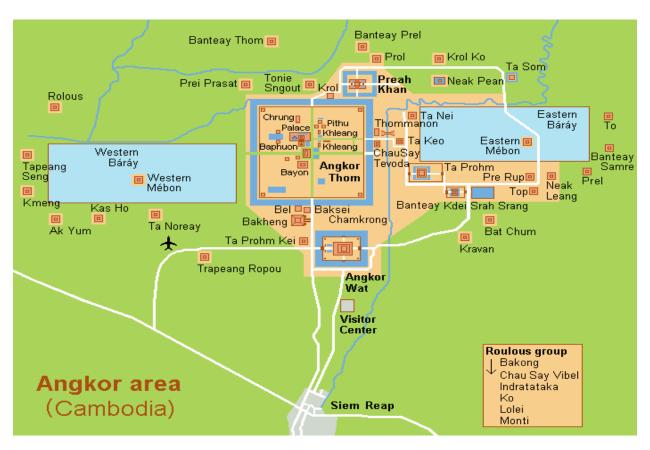
This article will focus on the general meaning of architectural plan as a plan and documentation for a building project.

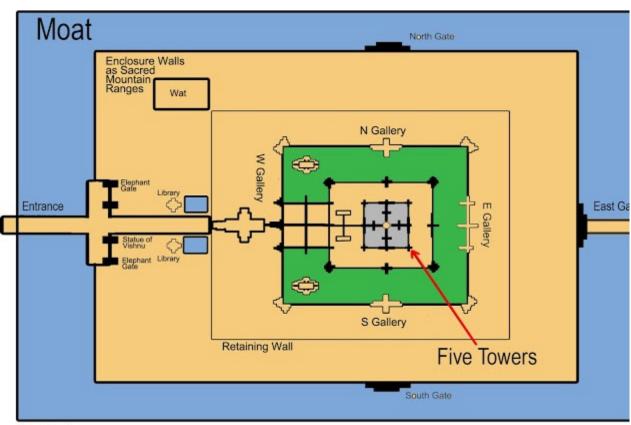
Aspects of an Architectural Plan: A building is a man-made structure with a roof and walls standing more or less permanently in one place. Buildings come in a variety of shapes, sizes and functions, and have been adapted throughout history for a wide number of factors, from building materials available, to weather conditions, to land prices, ground conditions, specific uses and aesthetic reasons. To better understand the term building compare the list of nonbuilding structures. The gallery below gives an overview of different types of building.



Temples: Angkor Wat, Ta Prohm, Angkor Thom, Phnom Bakheng & Our Hotel: Angkor D'Tresor Resort

Angkor Wat means Capital Temple, it was built by a Khmer King in the early 12th century as a Hindu temple but gradually transformed into a Buddhist temple towards the end of the 12th century.





Angkor Wat Temple Layout

Talking of the temple, it is a very majestic structure. The structure is very intricate and very complex. It must have taken a lot of craftmen many years to build the temple. The entire complex is rectanglar in shape. Outside the outer wall is a moat. Within the wall are three rectangular structures stacked one on top of the other, each progressively smaller than the other. On the third level stands five towers.

Site planning

A site plan is an architectural plan, and a detailed engineering drawing of proposed improvements to a given lot. A site plan usually shows a building footprint, travelways, parking, drainage facilities, sanitary sewer lines, water lines, trails, lighting, and landscaping.

Such a plan of a site is a graphic representation of the arrangement of buildings, parking, drives, landscaping and any other structure that is part of a development project.

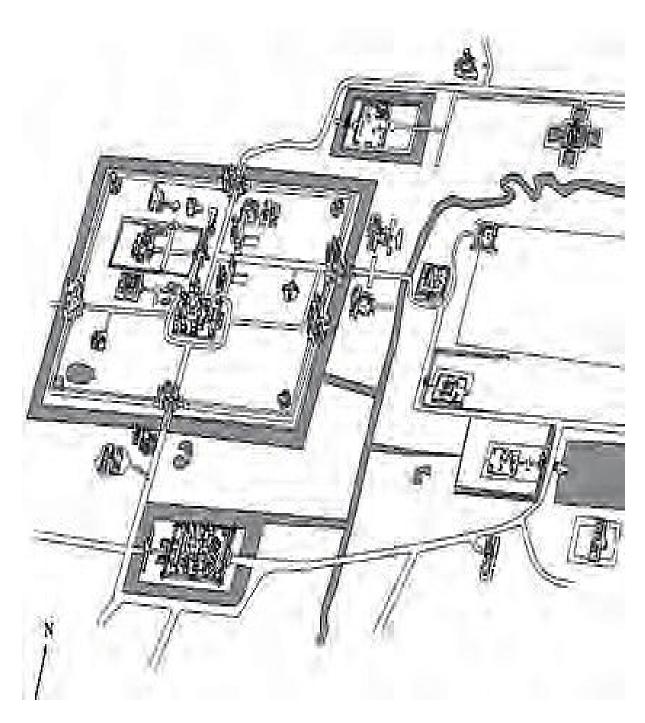
A site plan is a set of construction drawings that a builder or contractor uses to make improvements to a property. Counties can use the site plan to verify that development codes are being met and as a historical resource. Site plans are often prepared by a design consultant who must be either a licensed engineer, architect, landscape architect or land survey. The architect Map is part of a plan in Chandler, AZ.

The practice of designing, constructing, and operating buildings is most usually a collective effort of different groups of professionals and trades. Depending on the size, complexity, and purpose of a particular building project.

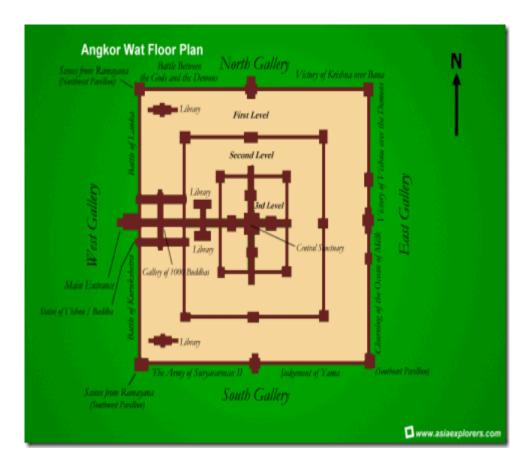
Floor plan

One of the major tools in architectural design is the floor plan. This diagram shows the relationships between rooms, spaces and other physical features at one level of a structure. Dimensions are usually drawn between the walls to specify room sizes and wall lengths. Floor plans will also include details of fixtures like sinks, water heaters, furnaces, etc. Floor plans will include notes to specify finishes, construction methods, or symbols for electrical items.

Similar to a map in a floor plan the orientation of the view is downward from above, but unlike a conventional map, a plan is understood to be drawn at a particular vertical position (commonly at about 4 feet above the floor). Objects below this level are seen, objects at this level are shown 'cut' in plansection, and objects above this vertical position within the structure are omitted or shown dashed. Plan view or "planform" is defined as a vertical orthographic projection of an object on a horizontal plane, like a map.



Below is a floor plan of the Angkor Wat temple. This shows the three levels, and the galleries that line the outer corridor.



Design process

A design process includes a series of steps followed by designers. Depending on the product or service, some of these stages may be irrelevant, ignored in real-world situations in order to save time, reduce cost, or because they may be redundant in the situation. Typical stages of the design process include:

- Pre-production design
 - Design brief a statement of design goals
 - o Analysis analysis of current design goals
 - Research investigating similar design solutions in the field or related topics
 - o Specification specifying requirements of a design solution
 - o Problem solving conceptualizing and documenting design solutions
 - Presentation presenting design solutions
- Design during production
 - o Development continuation and improvement of a designed solution
 - o Testing in-situ testing a designed solution
- Post-production design feedback for future designs
 - o Implementation introducing the designed solution into the environment

- Evaluation and conclusion summary of process and results, including constructive criticism and suggestions for future improvements
- Redesign any or all stages in the design process repeated (with corrections made) at any time before, during, or after production.

Architectural drawings

Architectural drawings are used by architects and others for a number of purposes: to develop a design idea into a coherent proposal, to communicate ideas and concepts, to convince clients of the merits of a design, to enable a building contractor to construct it, as a record of the completed work, and to make a record of a building that already exists.

Architectural drawings are made according to a set of conventions, which include particular views (floor plan, section etc.), sheet sizes, units of measurement and scales, annotation and cross referencing. Conventionally, drawings were made in ink on paper or a similar material, and any copies required had to be laboriously made by hand. The twentieth century saw a shift to drawing on tracing paper, so that mechanical copies could be run off efficiently.



Green is water

Architectural design values Building a complete replica of Angkor Wat in Minetest isn't practical without building on such a large scale that you'd never be able to see all of it at once

Architectural design values make up an important part of what influences architects and designers when they make their design decisions. However, architects and designers are not always influenced by the same values and intentions. Value and intentions differ between different architectural movements. It also differs between different schools of architecture and schools of design as well as among individual architects and designers.

Planning

A plan is typically any procedure used to achieve an objective. It is a set of intended actions, through which one expects to achieve a goal. Plans can be formal or informal:

- Structured and formal plans, used by multiple people, are more likely to occur in projects, diplomacy, careers, economic development, military campaigns, combat, or in the conduct of other business.
- Informal or ad hoc plans are created by individuals in all of their pursuits.

A lack of planning in any discipline may lead to a misallocation of resources, misunderstandings, or irrelevant sections added to Wikipedia articles such as this one.

Building construction

Building construction is the process of preparing for and forming buildings^[2] and building systems.^[3] Construction starts with planning, design, and financing and continues until the structure is ready for occupancy. Far from being a single activity, large scale construction is a feat of human multitasking. Normally, the job is managed by a project manager, and supervised by a construction manager, design engineer, construction engineer or project architect. For the successful execution of a project, effective planning is essential.

Garden design-Landscape design

Landscape planning is a branch of landscape architecture. Urban park systems and greenways of the type planned by Frederick Law Olmsted are key examples of urban landscape planning. Landscape designers tend to work for clients who wish to commission construction work. Landscape planners can look beyond the 'closely drawn technical limits' and 'narrowly drawn territorial boundaries' which constrain design projects.

Landscape planners tend to work on projects which:

- are of broad geographical scope
- concern many land uses or many clients
- are implemented over a long period of time

In rural areas, the damage caused by unplanned mineral extraction was one of the early reasons for a public demand for landscape planning..

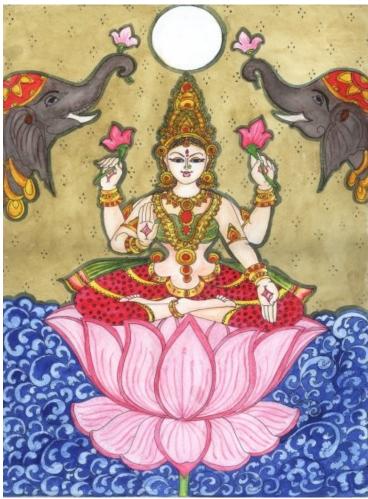
Garden design is the art and process of designing and creating plans for layout and planting of gardens and landscapes. One can imagine there being gardens at Angkor- the design may have been done by the architects/designers themselves-or by professionals of varying levels of experience and expertise of those days which one can imagine was much Today m Most professional garden designers are trained in principles of design and in horticulture, and have an expert knowledge and experience of using plants. Some professional garden designers are also landscape architects,



Lotus at the Angkor still water moats God's own favourite

In the form and personality of gods and goddesses of the world, the lotus symbol has a special and important place. Invariably the beauty and greatness of the deities are described with reference to the lotus. Their various limbs especially hands, feet, face and eyes are likened to it. Many of these gods also hold in their hands, besides other things, the lotus too. Still others are depicted as being seated on a lotus. eg. Lakshmi, Sarasvati, Brahma, Vishnu. Jainism too has a special place for the lotus and the Jain Tirthankaras are depicted as seated on the flower.

Amongst the Hindu Trinity, it is the innumerable forms of Lord Vishnu that are frequently connected with the lotus. Many are the lotus related names of Vishnu that can be selected out of the thousand names of the Lord eg. Pundarikaksha, Padmanabha and a host of others. Brahma's birth place was the lotus and hence he is referred to as Kamalaja, Kamalasana, Kamali, Kamalodhbava and so on. The lotus has a special affinity with the Sun God or Surya. Sanskritists fondly describe the sun as a friend of the lotus (Kamalabandhu), controller of lotus (Kamalanatha), darling of lotus (Kamalavallabha) and with many other epithets. The flower blooms at sunrise and sets at sunset alluding to the fact that, all living beings in the world become active with sunrise and retire for the day at sunset. The sun god is the only male deity holding lotuses in both hands. He is also seated on a lotus. The connection between the sun god and the lotus is also extensively dwelt upon in the literatures of various countries like Egypt, Tibet, China, Japan and so on.



Amongst the goddesses, Lakshmi has the closest connection with the lotus. She has lotus in her hands, wears a garland of lotuses and all her limbs are comparable to a lotus. Dr Ananda Coomaraswamy has divided Lakshmi idols

into three categories - lotus-seated (Padmasthita), lotus-holding (Padmagraha) and lotus-residing (Padmavasa). According to Vishnu Purana, at the time of her emergence, Lakshmi was seated on a lotus and also held the flower in her hand. There are numerous iconographical, sculptural and numismatic evidences and references that depict Lakshmi and Sarasvati in relationship with the lotus. In the Sunga period sculptures, she is shown as seated or standing on a lotus. A miniature image of the Kushana period shows her holding a lotus and a Sunga coin shows her standing on a lotus with a flower in her hand. There is carved image of Sarasvati seated on a lotus on the Bharhut column.

Lotus.in.Buddhist.tradition

Buddhism abounds with interesting references to the lotus. According to Buddhist beliefs, Buddha had the sign of a lotus on his feet and at birth, wherever he placed his foot, lotuses bloomed. Most Buddha images show him seated on a lotus in bloom. The lotus symbolizes his other worldliness, his great compassion for creatures of the world, his immortality and enlightenment besides his impeccable purity of mind and body.



Buddhas seated on a lotus in bloom or on a lotus-seat have been found in chaityas, viharas, stupas and caves in many countries. Not only Buddhas but Bodhisattvas too are lotus seated and holding a lotus. A Bodhisattva is one who has the capacity and potential and the qualities needed to become a Buddha. One such example is the Bodhisattva Avalokitesvara. He is the most worshipful and revered Bodhisattva and very popular in China, Japan, Korea and other Eastern countries. He holds a lotus with a long stem in his left

hand and is generally seated on a lotus in full bloom. The lotus is also associated with various other Buddhist gods and goddesses like Tara, Paramita and Kwan Yin. Besides religion, the lotus plays a significant role in Buddhist philosophy too.

Buddhist mandalas (vantras) depict different Buddhas and Bodhisattvas inside a lotus or on its petals. The most revered Buddhist mantra is 'Om Mani Padme Hum' - "Oh jewel within the lotus, we bow to you." The Buddhist Mahayana treatise is titled Sadharma Pundarika Sutra meaning, "the lotus, a key to the religion of truth. It is otherwise called Lotus Sutra. According to another sutra, the image of Universal knowledge rests on a white lotus which, is also the heart symbolizing self-bliss and ultimate bliss. A chant goes that when the white lotus descends on earth it changes everyone's life for the better. Buddhist ages, with reference to the cosmos, are also initiated by the appearance of a lotus. Again, it is this flower that augurs the birth of a Buddha. If there are no blossoms, no Buddha will appear. At the beginning of the current era, the Bhadrakalpa, there were 1000 blossoms signifying the birth of 1000 Buddhas. Four virtues are attributed to this flower - scent, purity, softness and loveliness. While these qualities can be seen in other flowers too, Chinese botanists at one time believed that the lotus flowered and bore fruit at the same time, thus symbolizing the ability to transcend the limitations of time. It was this belief that elevated it to a privileged status amongst flowers. Not only in this life but also in the after life, the lotus has a special place in Buddhist tradition.

Lotus.and.after-life

The Lotus sect of Chinese Buddhism believes that people are freed from the cycle of birth and death by going to a celestial sphere called the Western heaven. This paradise contains seven treasure ponds. The bed of these is covered with gold dust and the lotuses there are as big as carriage wheels. So whether the lotuses floated during the Hindu period or the Buddhist —probably both!

Buddhist temple courtyards often depict the Sacred Lake of Lotuses. The significance of this can be gauged from the following related story: "Each soul has a lotus on this lake, which will open to receive them after death and where they will wait until the time of its opening. The flowers thrive or droop according to the piety of the individual on earth. For the devout, they open immediately when he dies, admitting the soul at once to the divine presence." In China, the envelopes given to the family at a funeral are impressed with the outline.of.a.lotus.

Transportation planning

Transportation planning is the field involved with the siting of transportation facilities (generally streets, highways, sidewalks, bike lanes and public transport lines).

Transportation planning historically has followed the rational planning model of defining goals and objectives, identifying problems, generating alternatives, evaluating alternatives, and developing the plan. Other models for planning include rational actor, satisficing, incremental planning, organizational process, and political bargaining. However, planners are increasingly expected to adopt a multi-disciplinary approach, especially due to the rising importance of environmentalism. For example, the use of behavioral psychology to persuade drivers to abandon their automobiles and use public transport instead. The role of the transport planner is shifting from technical analysis to promoting sustainability through integrated transport policies.

Urban planning

Urban, city, and town planning is the integration of the disciplines of land use planning and transport planning, to explore a very wide range of aspects of the built and social environments of urbanized municipalities and communities. Regional planning deals with a still larger environment, at a less detailed level.

Another key role of urban planning is urban renewal, and re-generation of inner cities by adapting urban planning methods to existing cities suffering from long-term infrastructural decay. The picture below is an architecture map of a part of south Chandler, AZ.





Immediately one can see the quality of the workmanship, with the finely carved capital of this column, with its decoration extending to the wall above that which it supports. In the entrance is one of the many Apsaras in Angkor Wat. Note the crown with three peaks. This is typical in these Khmer Apsara carvings.





More Apsaras, with even fancier hats/ Carvings on a column.





Above picture(RIGHT) a yellow-garbed Buddha in the entrance hall. Angkor Wat was dedicated to Vishnu when built. But in the late 13th century, Angkor Wat gradually moved from Hindu to Theravada Buddhist use, which continues to the present day. Angkor Wat is unusual among the Angkor

temples in that although it was somewhat neglected after the 16th century it was never completely abandoned.

Passing through the gate tower, we see the interior Angkor Wat temple ahead of us.



Here is one of the two "libraries," one on each side of the entrance walk. Though today they are called libraries, no one really knows what these buildings were used for.

Looking towards the main temple. There is a green covering over an area undergoing restoration.

Angkor Wat required considerable restoration in the 20th century, mainly the removal of accumulated earth and vegetation. Work was interrupted by the civil war and Khmer Rouge control of the country during the 1970s and 1980s, but relatively little damage was done during this period other than the theft and destruction of mostly post-Angkorian statues. Restoration work was done between 1986 and 1992 by the Archaeological Survey of India. Since the 1990s, Angkor Wat has seen continued conservation efforts and a massive increase in tourism, which now exceeds 1,000,000 visitors per year, and is growing at about 25% annually.

The temple is part of the Angkor World Heritage Site, established in 1992, which has provided some funding and has encouraged the Cambodian government. The German Apsara Conservation Project (GACP) is working to protect the Apsaras and other bas-reliefs which decorate the temple from damage; around 20% were in very poor condition, mainly because of natural erosion and deterioration of the stone, but in part also due to earlier restoration efforts. Other work involves the repair of collapsed sections of the structure, and prevention of further collapse: the west facade of the upper level, for example, has been buttressed by scaffolding since 2002, while a

Japanese team completed restoration of the north library of the outer enclosure in 2005. World Monuments Fund began work on the Churning of the Sea of Milk Gallery in 2008.



This is followed by martial scenes of warfare between the Kauravas and the Pandavas.

The Outer Gallery

There is a right tujrn to enter into the Outer Gallery.

Following is a list of the sets of bas-reliefs on the walls of the outer gallery. The bas-reliefs are divided into sections, usually two on each wall of the square gallery. Each section depicts a specific theme. These are in sequence, counter-clock wise, after entering through the main entrance. West Gallery

- The Battle of Kurukshetra between Pandavas and Kauravas South Gallery
- Army of King Suryavaman II, the builder of Angkor Wat
- Judgment by Yama and the tortures of Hell East Gallery
- · Churning of the Ocean of Milk
- A battle between Vishnu and a force of Asuras
- North Gallery (said to be the best preserved)
- The Victory of Krishna over the Asura demon King Bana
- Battle between the Devas (Gods) and the Asuras (Demons)
- West Gallery
- Battle of Lanka between the Rakshasas and the Vanaras or monkeys

Battle of Kurukshetra

This battle scene is the main subject of the Hindu epic Mahabharata. It recalls the historic wars in Kurukshetra, a province in India, and depicts the last battle between rival enemies who are cousins. The armies of the Kauravas and the Pandavas march from opposite ends towards the center of the panel where they meet in combat. Headpieces differentiate the warriors of the two armies. The scene begins with infantry marching into battle and musicians playing a rhythmic cadence. The battlefield is the scene of hand-to-hand combat and many dead soldiers.

Chief officers and generals (represented on a larger scale) oversee the battle in chariots and on elephants and horses.

This first bas relief depicts the Battle of Kuru against armies of Champa led by Angkor Wat founder Suryavarman II. This honors the kind who built this temple, though it has nothing to do with the Mahabharata.





The Southwest Pavilion

The Southwest Corner Pavilion has a variety of scenes from the epic Ramayana. The upper panel shows a central figure that is the focus of all others. The bottom seems to show women and a child. They seem from another tribal group as the ones above, due to different clothes and head dressings.



Rama has shot Vali, the monkey king, with an arrow. Vali lies in the arms of his wife (three pointed headdress), and monkeys mourn his death.



Army of King Suryavarman II

This gallery depicts a triumphal procession from a battle between the Khmer and their enemies.



Here is King Suryavarman II, the builder of Angkor Wat, sitting in his throne, holding audience. Servants around him hold fans and ceremonial umbrellas.



This looks like a group of monks, attending the king.



This is someone, I think a queen, being carried in a covered chair.



The South Gallery, with its corbelled arch.



More marching troops, wearing helmets and carrying spears.



Officers riding horses. The important figures are larger sized.





Here is King Suryavarman II again, sword across his shoulder, riding an elephant.



The Judgment of Yama and the Tortures of Hell

The Judgment by Yama depicts the Khmer's ideas of heaven and hell. The spirits of the dead are brought to the god Yama to await their judgment. The good ones are allowed to proceed to one of the 37 heavens of Hindu mythology, where they enjoy idyllic surroundings in the celestial palace and

are rewarded by a pleasant life of leisure. The sinners, yoked in groups of four, are dragged by Yama's assistants into one of the 32 hells and receive terrible punishments.

Departed spirits line up to enter the place of judgment, and heaven and hell. From the left lead the two paths, one to the heavens (above), and the other to hell (below). We see the souls of the good being carried on thrones and palanquins on their way to heaven, while the damned are dragged to hell, towards their punishment, like cattle, with a rope through their nostrils.



Here are women being taken into hell. The executioner is keeping order, and keeping them moving.



On the way to hell, I guess a couple of spirits were getting unruly. The executioner is holding them by their ankles, upside down. Notice the trees in

the background.



On the way to heaven, things are much more peaceful.



On the path to hell, the executioner keeps all the damned spirits in line.



On the path to heaven, this looks like an Apsara queen, being approached by some men. More Apsaras are in the background.



Here, in the line of the good, an Apsara is being greeted and worshiped by a group of kneeling men.



Damned spirits are chained together in groups of four. This makes it easier for the executioner to keep them moving and in order. I don't think I want to be in this line.



A group on the left is being pulled by their chain, while on the right, an elephant grabs several rowdy souls.



Here is one of the good being carried on a palanquin.



Yama, the Supreme Judge, with multiple arms holding sticks (or something like that), wielding a staff and riding a buffalo. Departed spirits await judgment. Yama points out to his scribes the upper road representing heaven and the lower one of hell.



Assistants to Yama shove the wicked through a trap door to the lower regions of hell where torturers deliver punishments such as sawing a body in half for those who overeat, or forcing them to swallow red-hot coals.

The tortures are varied and are but transitory – the Hindu religions knowing nothing of eternal damnation. It is worth noting that the guards and executioners, generally large in stature and aided by ferocious beasts, are themselves also damned.



A view walking down the corridor beside the South Gallery.



Here is one person being punished in hell. Lawbreakers have their bones broken. I think this is what is happening here. The glutton is cleaved in two, rice thieves are afflicted with enormous bellies of hot iron. Some of the punished wear iron shackles. Those who picked the flowers in the garden of Shiva have their heads pierced with nails,



The Churning of the Ocean of Milk

The Churning of the Ocean of Milk is an ancient Vedic tale, found in the Bhagavad Purana (Canto 8 Chapter 7), Agni Purana and the Ramayana (Balakanda chapter). Here is the story, known as "The Story of Kurma Avatar," or "Samudra Manthan." Kurma, the turtle, is Vishnu's second avatar. Samudra is Sanskrit for "ocean," literally, "gathering of waters." The story below is copied from mahasivaratri.org. Some say that this gallery is the most important of all of them at Angkor Wat.

Legend Behind Samudra Manthan

Once Indra, the King of Gods, while riding on an elephant, came across Durvasa Muni who offered him a special garland. Indra accepted the garland but put it on the trunk of the elephant. The elephant was irritated by the smell and it threw the garland on the floor. This enraged the sage, as the garland was a dwelling of Sri (fortune) and was to be treated as prasada. Durvasa Muni cursed Indra and all devas to be bereft of all strength, energy, and fortune.

In battles that followed this incident, the devas were defeated and asuras (demons), led by Bali, gained control of the universe. Devas sought help from Lord Vishnu who advised them to treat the asuras in a diplomatic manner. The devas formed an alliance with the asuras to jointly churn the ocean for the nectar of immortality and to share it among them. Lord Vishnu told the devas that he would arrange that they alone obtain the nectar.

The Churning of the Ocean

The churning of the milk-ocean was an elaborate process. Mount Mandara was used as the churning rod and Vasuki, the King of Serpents, became the churning rope. Lord Vishnu himself had to intercede in so many ways to aid the devas. All kinds of herbs were cast into the ocean and many great beings and objects were produced from the ocean and were divided between the asuras and the gods. It is said that the following things emerged from the Samudra Manthan:

- Sura or Varuni Goddess and creator of wine
- Apsaras various divine nymphs
- Kaustubha a rare diamond said to be the most valuable jewel in the world
- Uchhaishravas the divine white horse
- Kalpavriksha the wish-granting tree
- Kamadhenu the wish-fulfilling cow
- Airavata the white elephant

• Lakshmi – the Goddess of Fortune and Wealth. Vishnu and Lakshmi were reunited after having been separated for many ages.

Haalaa-Hala - the Poison

During the Sagar Manthan by the gods and demons, haalaa-hala, a pot of poison, also came out of the ocean. This terrified the gods and demons as the poison was so toxic that its effects would have wiped out the entire creation. On the advice of Lord Vishnu, the gods approached Lord Shiva for help and protection as only he could swallow it without being affected. On the request of the gods and out of compassion for living beings, Lord Shiva drank the poison. However, Parvati, Lord Shiva's consort, pressed his neck so that the poison did not reach his stomach. Thus, it stayed in his throat neither going up nor going down and Shiva remained unharmed. The poison was so potent that it changed the color of Lord Mahadeva's neck to blue. For this reason, Lord Shiva is also called Neelakantha (the blue-necked one) where 'Neela' means blue and 'Kantha' means neck or throat.

As part of the therapy, doctors advised the gods to keep Lord Shiva awake during the night. Thus, the gods kept a vigil in contemplation of Lord Shiva. To amuse Shiva and to keep him awake, the gods took turn performing various dances and playing music. As the day broke out, Lord Shiva, pleased with their devotion, blessed them all. Shivaratri is the celebration of this event by which Shiva saved the world. Since then, on this day and night – devotees fast, keep vigil, sing glories of the Lord, and meditate.

Churning Out Divine Nectar

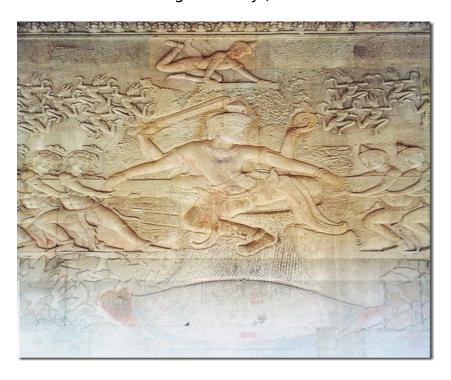
At last, Dhanvantari, the Divine Physician, appeared with a pot of Amrita (nectar of immortality) in his skillful hands. Fierce fighting ensued between devas and asuras for the nectar. To protect the nectar from asuras, devas hid the pot of nectar at four places on the earth – Prayag (Allahabad), Haridwar, Ujjain and Nasik. At each of these places, a drop of the nectar spilled from the pot and since then, it is believed that these places acquired mystical power. Grand Kumbh Mela is celebrated at the four places after every 12 years for this reason.

Eventually, Lord Vishnu took the form of a beautiful woman, Mohini. While her beauty bewildered the asuras, Mohini seized the nectar and returned it to the devas, who drank it immediately.

Below, a row of 92 asuras (demons with round bulging eyes and crested helmets) pull the king of the Nagas, Vasuki, to churn the Ocean of Milk.



In the center is Vishnu, aided by his avatar, the turtle, Kurma. Indra is above Vishnu, watching the action. (This image is from the Wikimedia Commons. I was not able to get a good photo of this. Taking pictures of these bas-reliefs was not easy; you only can have natural light or a flash, and the flash washes out the image entirely.)



Below are the 88 devas (gods with almond-shaped eyes and conical headdresses).

To begin the motion, the gods and demons twist the serpent's body; the demons hold the head and the gods hold the tail of the serpent. Then by pulling it rhythmically back and forth they cause the pivot to rotate and churn the water.



At this point, our guide led us into the temple. We did not see any of the other galleries. I regret this now.

We took these stairs up to the second level. Again, wooden steps have been built over the original stone steps.



At the top of the stairs we were met by this group of Apsaras, I guess decorating the entrance.



People mill around in a second level courtyard. These stone structures, built without mortar, with just the stones fitted together by the stone masons, have withstood time amazingly well.

This is one of the four corner towers on the third level.



The Baken at Angkor Wat - The Main Sanctuary, Third Level

Bakan is the Khmer name of what used to be the principal sanctuary of Angkor Wat. It is the summit of Angkor Wat's central temple, the highest of the temple's three levels and the uppermost point of world's largest religious complex. To get there we climbed up a steep wooden stairway to the third level. It was steep enough that I was grateful for the handrail.

Looking back at the two lower levels.



Here is a reclining Buddha, covered in saffron. This reclining pose, with his head resting on his hand, is a "Sleeping Buddha."

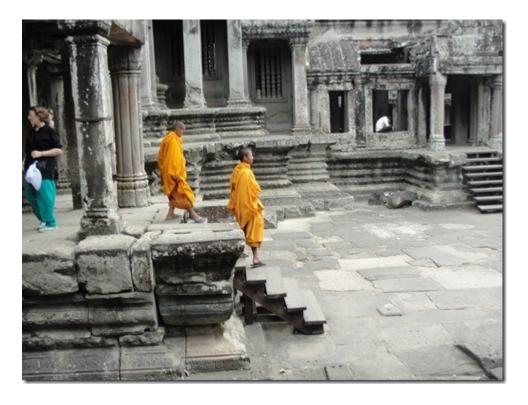
There are four special Buddhas at this level, one under each of the four corner towers. It is considered auspicious to see each of these Buddhas.



This is a view of the courtyard at the third level.



Two Buddhist monks walk into the courtyard.



More Apsaras.



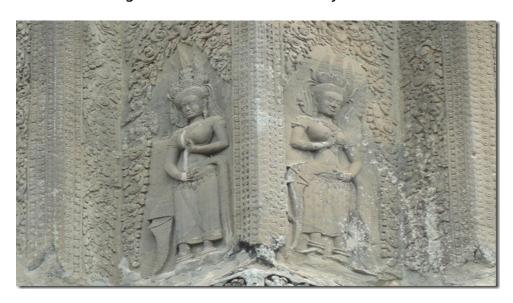
Notice how the stone is black in some places? This is where visitors have rubbed their hands, it is human body oil. People seem to like rubbing the breasts and tummy of the Apsara on the left. The other girls don't get so much attention.

The base of the central tower.



This is the central tower of Angkor Wat.

More Apsaras, on a tower. The stone carving is so fine, with a delicate leafy background for both figures. Does not look 800 years old to me!



The monks in the courtyard get their cameras out to snap some photos. Many young men in Cambodia become monks for just a year or two. They get education and are considered afterward better candidates as husbands when their families try to find wives for them. So you see many young monks.

The central tower. This is the main tower in the largest Hindu temple on the planet. When you are there, stop and take a look, and take it all in. At the base of this tower there originally was a shrine to Vishnu. We do not know the name of the image of Vishnu that was once in the central tower, since it was removed, I think, in the late 1300's when Angkor Wat was converted into a Buddhist temple. There are now four Buddhas under this tower.



Looking from the third level towards the main entrance.



People below. They have just climbed the stairs up to the second level.



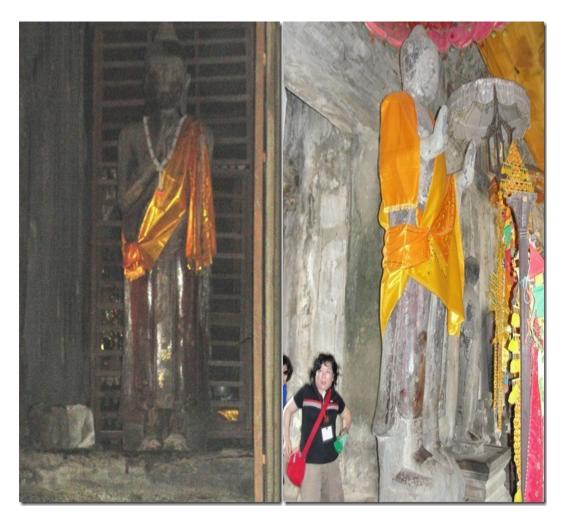
A headless statue. I think, because of the position of the hands, Dhyana Mudra – the gesture of meditation with both hands resting on the lap, palms upwards – that this was Buddha in meditation.



Here is another such Buddha. It is interesting to me that Lord Buddha is protected by Nagas, cobras, above him. This is a usual Hindu image, not so common as a Buddhist one. I think it shows the fusion of images from Hindu to Buddhist.

To RIGHT

Another of the four Buddhas at each corner of the third level. Here he stands with his palms together. This is Namaskara Mudra – the gesture of prayer. This is the hand gesture that evokes greeting another being with the utmost respect and adoration for the Divine in all.



. Looking down at the second level again



Here are the stairs down. Now we are especially happy there is a hand rail. Carol, in the black blouse, is about half way down.



We then entered what is called "The Hall of One Thousand Buddhas," on the second level. It is called this because many people, over hundreds of years, have left Buddha images and statues here. Most have been removed, but many still remain.



Another larger-than-life Buddha, this one with two hands facing outward. This is Fearlessness (Abhāya Mudrā), displaying fearlessness in the face of adversity and enjoining others to do so. When done with two hands it is also called "forbidding the relatives." When it is just the right hand it is also called "calming animals." I am not sure what Buddha was forbidding the relatives from doing. It is kind of amusing that fearlessness and dealing with relatives are the same gesture.

Looking back towards the main temple.



We are now on the first level, in a cross-shaped hall near the entrance.

To support this idea, here is something that I found from sacredsites.com:



Using computer simulations it has been shown that the ground plan of the Angkor complex – the terrestrial placement of its principal temples – mirrors the stars in the constellation of Draco at the time of spring equinox in 10,500 BC. While the date of this astronomical alignment is far earlier than any known construction at Angkor, it appears that its purpose was to

architecturally mirror the heavens in order to assist in the harmonization of the earth and the stars.

If this is correct then the origins of Angkor Wat is indeed ancient. 10,500 BC would have been in the early days of agriculture in Southeast Asia. It makes sense to me that people performing this kind of careful astronomical observation would be settled in one place from which to observe, not roaming hunter gathers. Being settled in one place requires agriculture. One can even today see boats which resemble what was thwe way of life earlier Pic shows crew in two boats, tied together on. а



Here is another classic photo of Angkor Wat, illuminated at night. (Picture from Ta Som Guest House.)



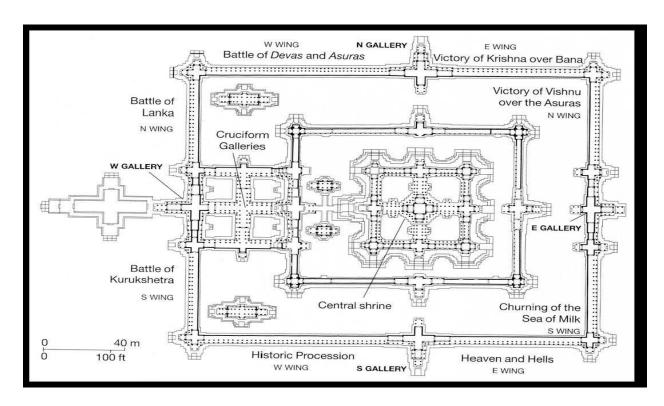
This was the third Angkor Wat temple we visited this day. By the time we got here, we were pretty tired and saturated.

DEVARAJA TRILOGY by the Author 1200 pages in 3 parts explaining the Devraja Concept in India and SE Asia on academia.edu

See also Puri, B. (1958). BRAHMANISM IN ANCIENT KAMBUJADEŚA. *Proceedings of the Indian History Congress, 21*, 95-101. Retrieved July 17, 2021, from http://www.jstor.org/stable/44145174



An interior view of the west gate building. Note the corbel arch used in order to construct the passageway. A corbel arch is constructed by adding layers of stones to the walls on either side of an opening, with each successive layer projecting further towards the center than the one supporting it from below, until the two sides meet in the middle. This is weaker than a true arch, of which the Khmer architects must not have known.



When Yasovarman I (889-915) succeeded Indravarman I, he erected a temple in honor of his parents, as his father had for his at Preah Ko (879,) usually regarded as the first temple of the Angkorian era. This second ancestral temple, Lolei, was built in the middle of his father's baray at Hariharayala (Roluos) setting a precedent for other later island temples such as East Mebon (953) built in Yasovarman's own Yasoharatataka or East Baray by Rajendravarman, West Mebon (c.1055) in the West Baray by Udayadityavarman II and Neak Pean (c.1200) by Jayavarman VII in his own layatataka Baray. Then Yasovarman I built a new capital at Yasodharapura a few miles from the future sites of Angkor Wat and Angkor Thom, centered around his own state temple mountain located on the crest of an actual mountain, or at least a hill, rising 78m above the Angkorian plain named Phnom Bakheng (phnom is Khmer for hill.) Thus, he built not only a temple mountain but a mountain temple including the actual topography in the temple's symbolic meaning, setting a precedent for more ambitious syntheses of nature and architecture such as Preah Vihear (11th Century) and Phnom Rung (1113 -1150)

Thus the temple itself, the towers of its *panchayatana* and those around its terraces and base could all be read as smaller replicas, "aedicules" and antefixes of the combined hill and pyramid, itself a symbol of the cosmic, "Platonic Form" of mountains, Mt. Meru, at whose base Phnom Bakheng sat, though at an incalculable distance from it. This creates an infinite regress of original and simulacrum, signified and signifier, as characteristic of Indic as postmodern thought.

Of all the temple mountains the Khmer built, Phnom Bakheng seems most cognizant of its possible Javanese precedent, Borobudur, (see figure 10,) in the multiple small, identical shrines lining its five terraces which are, however, too narrow to allow circumambulation, thus precluding the need for mural bas reliefs and the didactic purpose of its putative original. The forty-four large shrines surrounding the pyramid's base also recall the phalanx of 224 pevara or guardian candi or small shrines standing watch at Candi Siwa at Roro Jonggrang (Prambanan,) Java. Nonetheless, the Bakheng's 108 shrines would be an impressive number of aedicules on the shikhara of all but the most ambitious Indonesian and Indian temples.

Mathematics: Phnom Bakheng, like every other Khmer monument, is constructed using precise mathematical calculations, leading some to the conclusion it must have functioned as some sort of astronomical or astrological instrument, at a time when there was no distinction between the two. In the absence of historical evidence, an exegete is free to choose among a plethora of possible sidereal phenomena and methods of measuring Khmer temples which are necessarily somewhat arbitrary. These have included: number of footsteps, (but whose foot?) distance from the outer edges of a structure (generally used in this introduction,) distance from a structure's center, ratios of a temple's length, width or diagonal, its intercolumniation, its inter-fenestration, arc-seconds of the azimuth or path of the sun or moon, etc. Under these circumstances, most such theories must be regarded as ingenious or merely ingenuous, creative or simply credulous, suggestive or just obsessive. Jean Fillozat of the EFEO, École Française d'Extrême Orient, for example, noticed that from any point around the Bakheng only thirty-three shrines are visible - which coincides with the number of years it takes a lunar calendar of 354 days and solar calendar of 365 to come into sync, (as well, one might add, as the number of Vedic deities, the levels of consciousness in Buddhist cosmology, Christ's age at his death, a third of one hundred and any number of other related and unrelated phenomena.) He also noted that each quadrant contained twenty-eight towers, equal to the days of a four-week lunar month, while six times the sixty terrace shrines plus the five towers on their summit equals 365, the days in a solar year. With a little more arithmetic, one could soon discover that a four year lunar cycle has 1416 days and a solar or Gregorian cycle, 1461 days, the same four digits and hence the same sum, twelve, equal to the number of months in a year (or hours of sunlight at the equinox, half a 24-hour day or eggs in a dozen, for that matter.) These two four-year cycles are also forty-five days out of sync, the number of the 44 shrines around the base plus the central one. Phnom Bakheng, the temple itself, could even be pressed into service to provide the "intercalation" or "embolism" of 366 shrines each leap year. Since any of these congruities may have resulted from serendipity or even wishful-thinking, the only conclusion to be drawn

from them is that the temple could have functioned as an observatory, - not that it did.

Numerology figured as prominently in the Vastu Shastra and Khmer life as astrology with which it is intertwined; it determined the date to begin a temple's construction or to start a war; it was used to calculate the size of a pada for a mandala; the "sum" of the letters of a donor's name could decide which god a temple honored and almost every number had numerous interpretations. Special attention was paid to the ratio between the dimensions of a temple's parts, like Pythagoras' or Palladio's harmonic fractions or Corbusier's "golden mean ratio" or "modulor." For example, 108, the number of shrines at Phnom Bakheng (less the center one) was regarded as especially auspicious since 108 has so many "auspicious" factors - 2, 3, 4, 6, 9, 12, 18, 27, 54, (although, as noted, most numbers could be auspicious, ominous or both.) The sum of the digits in 108 equals nine; a "magic square" can be constructed around that number because as the initial digits of its multiples increase, their final digits decrease by an equal amount, so all equal nine - 18, 27, 36, 45, 63, 72, 81, 90, 108, 117, 126, 135, 144, 153, 162, 171, 180, 207, 216, 225, 234, 243, 252, 261, 270, 432. (99 might appear to present an exception but adding 1 to 9 = 10 while subtracting 1 from 0 = equals -1, the sum of which is also 9; although the Indians invented zero they overlooked negative numbers, so this anomaly may have caused needless perplexity.)

The fact that the total number of shrines is 109 not 108 might also seem to present a problem but, in fact, it would only have made that number more auspicious from the point of view of temple's shthapakas or architects, since 109 is an irrational number and therefore cannot be factored, endowing it with both mystery, unity and "adamantine" invulnerability. The Vastu Shastra, attached special significance to a number's "remainder" after factoring; this might be related to the consistent asymmetry of Khmer temples, their unfinished state or simply an irrational fascination with the irrational, closely allied to the numerological, the magical and hence the sacral. 109's remainder is one, the uniquely indivisible singularity and origin of all other numbers, thus associated with the primal bindu, the seed of all, absolute, Brahman, atman, the uncreated creator and *primum* mobile. Buddhism is more rigorous numerologically than Hinduism: since zero precedes even one, sunyata or nothing is regarded as the ultimate uncreated or not "dependently originated" reality.

The temple is situated on a raised terrace, higher than the city. The height of Angkor Wat from the ground to the top of the central tower is greater than it might appear: 213 meters (699 feet), achieved with three rectangular or square levels (1-3) Each one is progressively smaller and higher than the one below starting from the outer limits of the **temple**. The main materials used to construct Angkor Wat were

sandstone and laterite (a clayey soil and rock material rich in iron and aluminum). Sandstone was used as the main material for visible parts of the temple.

The story behind the story, however, is the revolution in Angkor history. Most sources available today are more or less based on the arguments laid out by early 20th century epigraphy and archaeology- George Coedès, who published in French in the 1940s, and whose works were translated into English in the 1960s. Coedès defined the paradigm. He argued that Southeast Asia represented a 'Farther India', a land of gold that was conquered and colonized by waves of Indians from around 200 BC through 400 AD. His work also gave us the basic timeline of the kings and therefore the monuments. He helped lay out a narrative of a pre-Angkor Cambodia trapped in a dark ages. He and other scholars documented wars between the Khmers and the Chams that defined the rise of Angkor's first Buddhist king. The shadow of Coedès stretches so long because the Khmer Rouge, Vietnamese invasion and destructive poverty have kept international scholarship at bay. Only in the 1990s did meaningful work on Angkor resume.

Although we remain deeply in Coedès' debt for his tireless work on translating inscriptions and defining lines of kings, his interpretations are being picked off, one by one. Today there is no clear answer to Indianization. Most scholars today argue against the idea of Indian colonizers, although one oddball Brahmin sect, the Pasupatas, which were willing to mix with lower castes, may have settled in the region. But others suggest that Indian ideas came from Malays and other travellers visiting India and Sri Lanka, rather than from Indians actually settling in Southeast Asia.

Coedès' idea of the origins of Angkor have also suffered. He believed an early Khmer-speaking civilization grew up around southern Vietnam, based on a port called Oc Eo and a nearby city called Angkor Borei. The epicentre of Funan may have not even been where Coedès believed, in fact being placed further west in the Menam Basin. There is growing evidence that pre-Angkor sites were prosperous and dynamic, with hundreds or even thousands of temples and other archaeological remains now identified. The accepted foundation of classical Angkor, in the year 802, now looks less radical and more in keeping with an existing culture.

The first version of classical Angkor building, at a site called Roluos, was not even the main event but a city, Mahendraparvata, on Mount Kulen, some 50 kilometers distant from Angkor is the area which was the source of river waters and of quarries for the beautiful sandstone used for Angkor's monuments. The mountain was surrounded with a thick urban population of a city that was linked to Angkor and other surrounding areas, creating a vast urban.





ASURAS OR DEMONS -(ONLY REMAINING BAS RELIEF,) BAKONG (881)

The enclosure's asymmetry or elongation on the east would be of merely geometric interest if it did not have the potential to modulate the experience of worshippers as they proceeded along the Bakong's "liturgical axis" towards the shrine and Shiva *linga* (traced in red at the center of figure **14** above.) Entering at the 1st east *gopura* (1 in figure **13**, at right) they would find themselves outside the mandala's "sacred square" with the pyramid and sanctuary or *cella* at its center. Their progress across the enclosure and up the pyramid would therefore symbolize their quest

for satori or enlightenment and its levels, thresholds and stages of that progress. Along this route, their vision would initially be focused by the two long rectangular buildings (5,) the "sacristies" or "libraries," in a narrow vector (maroon) limited to the eastern steps, the twelve shrines (7) of the 4th terrace and the tower of the 5th (8,) their path and goal. As they progressed past the crematoria (2,) memento mori of the samsaric selves they were abandoning, through the purifying flames of the border vaira strip (10) and across the "threshold line" (6, broken turquoise line) into the mandala's sacred space, their view would widen to include the 3rd terrace (orange vector) and the two eastern peripheral shrines (4.) Once, they were past the "libraries" (5) and stood before the Nandi shrine (at center,) they could see the full breadth of the enclosure (yellow vector) and all four of its northern and southern shrines. Upon reaching the foot of the eastern steps, however, the mass of the pyramid would block the view (purple vector) of anything but the five flights of stairs ahead of them to the central tower, now lost from view. Only upon attaining the 4th terrace, (7) would they again be able to see the entire tower and have a 360° view of the enclosure, its asymmetrical eastern and symmetrical western halves, its full complement of eight peripheral shrines, standing around it like guardians, its three enclosures and beyond that the pedestrian, mundane world, which from this new, elevated perspective, might well seem defamiliarized, very distant, even unreal or maya. The slight setback of the central tower on the 5th terrace (8), the resultant asymmetrical advance of the front four shrines on the fourth terrace (7) and the elongated diagonals of the inner corners of the four eastern towers and their plinths (olive lines) might induce a kind of "forced perspective," exaggerating the 12% setback of the shrine and terrace and hence the viewers' distance from the 1st east gopura where they first left the quotidian world. This view would reverse what they had just experienced climbing the Bakong: the contraction of distance as they were drawn from the rectangular enclosure into the "still center" of the square, 9x9-*pada* mandala.

The Asymmetry of Khmer Temple Mountains

Almost all Khmer temples are, like the Bakong, offset to the west, (or, exceptionally, to the east, in the case of the west-facing Angkor Wat,) so their two sides are asymmetrical. Their western two quadrants are often two squares and hence are entirely contained within the sacred grid of the governing mandala; (at the Bakong, Phnom Bakheng and Baphuon the mandalas have symmetrical strips on either side.) Their eastern sides, in contrast, are two rectangles which extend beyond the mandala's eastern border or "threshold line" to the 1st enclosure's outer walls and include whatever structures (shrines, crematoria, galleries) are inside it. Great ingenuity is applied to bring these two opposing geometric systems – and cosmic orders – into alignment, representing the asymmetrical, "out-of-

joint," chaos and continual flux of the profane world of illusion on the east and the symmetrical, precisely ordered, solidity of the square, - the "perfect form" in Hinduism - on the west. This produces a momentum in both the vertical and horizontal dimensions, a contraction and concentration along the "liturgical axis," climaxing at the central shrine at the center of the mandala where all motion is frozen. Architectural and experiential space is further compressed as the worshipper approaches the smallest and highest terrace and then enters the still smaller shrine and finally the dark sanctuary or garbagriha, the primordial cave or "womb chamber," in whose deepest recesses lurks the god, himself a manifestation of the seed, bindu, and dimensionless dot from which existence and extension and the universe emanate from the non-manifest, only to be sucked back at its destruction at the end of every mahayuga.

The darkness of the garbagriha at the end of the liturgical path is one way to architecturally sunyata, emptiness, the "around-of-nonbeing," moksha and nirvana. Hindu temples could therefore be seen as paradoxically expressing their own ephemerality and lack of substance, their future dematerialization and disappearance, the "extinguishing" of all form and dimension. Does this account for the constant oscillation between emergence and contraction, between architectural prolixity articulating inner emptiness which sometimes makes Indian temples appear to jitter and pulsate? Could this be the ultimate architectural feat or sleight-of-hand, all the more impressive for reducing unprecedented masses of masonry to shimmering illusion? It provides a striking contrast with the expansiveness of Gothic vaults, Renaissance domes and Baroque quadratura (architectural trompe l'oeil,) as well as the measured, human-scaled spaces of a Greek temple or Palladian villa. The centripetal tropism and compression combined with mural decomposition into scintillating surfaces of Hindu sacred buildings is not uncommon in Islamic architecture where the liturgical axis or gibla draws the faithful from the external world through the sahn or avlu, the enclosed courtyard with its shadrivan or ablution fountain, before it enters the *masjid* or *cami*, the prayer hall, where it finally disappears in the infinite recess of the *mihrab* niche, stretching back to Mecca, the Kaaba in its shroud and finally Al Aswad, the Black Stone. Islam shares with Hinduism Buddhism. absolute. and an Allah. like Brahman or sunyata can only be expressed apophatically and aniconically because it cannot be represented, imitated, named or conceived, "No vision can grasp him but his grasp is over all vision;" "He is the beginning and the end, the manifest and the hidden." (Quran, 6:103; 57:3.) Allah, derives from the general Semitic term for a god, ilah, cf. Heb. Elohim, which means "the hidden." Similarly, in Judaism God's name cannot be written except with the elliptical tetragrammaton, Y*H*W*H. While in Islam this has taken the form of iconoclasm, a prohibition on representation of the created, parallel to the early aniconic linga of Saivism, in Hinduism and Buddhism it has had the opposite effect – an endless proliferation or avatars, bodhisattvas, *yoginis, apsaras* and erotic *mithunas*.

The asymmetry of the Khmer temple mountain could be attributed more pragmatically to an attempt to accommodate liturgical functions into an antipathetic symmetrical form - the pyramid, which, as already discussed led to the wide-spread adoption of asymmetrical, "linear expansion" in both Cambodian and Indian temple design, (see section III. "Linear Expansion: Phimai & Kandariya Mahadeva.") At the same time that Suryavarman II (1113-1150) was building the pyramid of Angkor Wat, most of the other temples he constructed added *mandapas* and porches to the east of their shikharas, for example, Phimai, Banteay Samre and Thommanon, so the sanctuary or central shrine is also offset to the west of their enclosures. The extreme in asymmetry, however, is not found at Angkor's temple mountains but at the mountain temple, Preah Vihear, on the border of Thailand, whose "processional path" stretches a kilometer before reaching its unassuming shikhara, beyond which is a sheer 2100 foot precipice; this might be seen as the most explicit and dramatic possible architectural expression of sunyata, the goal of Hindu and Buddhist, self-extinction, tumbling literally into the void of emptiness. (For a photographic survey of Preah Vihear's north-south axis, click here.) The overtly Mahayana Bayon raises the quest for symmetry to a higher level: not only does it draw its two rectangles of face towers into a square but then a circle, the perfect form in Buddhism, because emanating infinite, equal rays from an invisible bindu at is center. The last "temple mountain," it rejects the square Khmer prasat for a unique, circular shikhara, radiating eight sub-shrines, but goes beyond this, by blurring the distinction between center and periphery, by dispersing point of view everywhere to evoke the spaciousness without direction or location of "Buddha consciousness."

BOROBUDUR: Mountain, Mandala, Monument

BOROBUDUR, JAVA (770 - 830)

SUDHANA LISTENING TO ONE OF THIS "52 FRIENDS," BOROBUDUR (770 - 830)



The liturgical advantages of linear addition for temple design does not fully explain why, despite the paramount importance Indian architects attached to the concept of the "temple mountain" and their genius for finding ever more ingenious forms with which to express it, they do not appear to have attempted to build a pyramid in stone. Mountains, specifically the Himalayas, had long been seen as the haunt of the Hindu deities and the furthest reach from pedestrian, dust-bound humanity. The Khmer built temples on every mountain, or what passed for one, in their water-logged homeland and, where there were no hillocks, they erected mountains of masonry. Nor were they alone; one need not hypothesize improbable trans-continental "cultural transmission" to account for the appearance of pyramids as thresholds to the divine around the globe – but not in India. In the absence of the arch and steel girder, heaping mounds of earth and rubble or laying diminishing

courses of stones were the only practical means for making a man-made, imitation mountain of sufficient breadth and height to be convincing. The earliest "temple mountain" was probably the Step Pyramid of Djoser at Saqqara (2667 - 2648 B.C.E.,) followed by the "ziggurats" of Mesopotamia, a name meaning "to build a raised place" in Akkadian. The 14th Century B.C.E Babylonian Dur Kurigaizu may possibly have been the original "Tower of Babel," to the conquered Hebrews a symbol of pagan hubris competing with their monotheistic, unnamable god. In Mesoamerica, isolated from the Eastern Hemisphere for millennia, the largest, if no longer most impressive temple mountain, was built at Cholula near Puebla, in the 9th Century, the aptly named Tlachihualtepetl, "the mountain built by hand" in Nahuatl, all 4.45 million cubic meters of it, now a grassy hill crowned by a Christian church.

Did Indian sthapakas disdain a mass of masonry as too literal an interpretation of what was at best a metaphor with many possible metaphysical tenors? Or was their anti-materialistic theology offended by the notion of making an imitation mountain - an illusion of an illusion - preferring an obvious "aedicule" or icon of a mountain, thus emphasizing that a temple, a mountain and Mt. Meru were merely "dependently-originated" emanations and mirages which would be destroyed, like their creator, Brahma, every 311 trillion 40 billion years --just a "flash in eternity" in the words of the *Bhagavad Gita*. Still, it comes as a surprise that the first, great "temple mountain" in the Indic cultural ambit was built at a remote inland site surrounded by volcanoes on the Kedu Plain of South Java, 40km from present-day Yogyakarta. The temple mountain of Borobudur is estimated to have taken sixty years, from 770 to 830, to complete during the peak of the Mahayana Buddhist Sailendra Kingdom. Jayavarman II (790 - 835) may have been a feudatory of the Sailendras and even have spent time in Java before he declared the independence of the Khmer Empire in 802, while the temple was still under construction.

Perhaps as surprising as Borobudur's location is that this first "temple mountain" achieved a level of architectural and theological sophistication never again equaled or attempted. The temple appears not only to have been laid-out according to a mandala, like those of India, but to have functioned as one as well, a *yantra*, a diagram or device for "consciousness raising," here a literal pathway for attaining "enlightenment in this life-time" – or at least simulating its path over a weekend. Mandalas are intended to aid their makers' meditations and visualizations and then destroyed once their outward, illusory form had been internalized; hence, they have always been regarded as ephemeral, painted on perishable fabric or even drawn in sand. At Borobudur, however, groups of pilgrims were presumably intended in the coming centuries to make their way around the *padas* of each of mandala's concentric squares, upward and inward along a 3km long "liturgical path," towards its central stupa and tip, the primal *bindu* or dot, literally climbing

towards *satori* stone by stone and footstep by footstep. (Figure **10** on the following page is a detailed diagram of Borobudur showing the positioning of the 504 Buddhas on its four square side and circular top, as well as, the location of the Buddhist texts illustrated on the bas relief panels carved on the balustrades and walls of its terraces.]

Upwards of 3500 mandalas are recorded from the 9th Century and although scholars have been unable to find one which corresponds exactly with Borobudur's site plan, its similarities with several widely-used types are striking. For example, the 504 Buddha statues which line its terraces are aligned in accord with the Diamond World Mandala, one of the most widely used Tantric models. The 368 statues in the niches above the first four sian with the *mudra* of the four Mahayana dhyani, terraces tathagata or "wisdom" Buddhas, associated with the direction they face; the 72 Buddhas in the *dagobas* or stupas of the three round terraces (gold circles) have been associated with Vairocana, the central Buddha of that mandala of whom the other four are aspects or manifestations.

The identity of the 64 Buddhas on the 5th terrace (dark green) has occasioned considerable scholarly debate because 1) the Diamond World mandala has only Buddhas and 2) the 64 statues are depicted teaching *mudra*, not used in that mandala. Some have speculated that the Buddhas of the 5th terrace and in the stupas are both Vairocana, while others have suggested the "extra," "sixth" Buddha is the historical Buddha, born Siddhartha Gautama. A third group has put forward Vajradhara, a Buddha found especially in Vajrayana or Tantric sutras, the Adi-Buddha or source of the other five, representing the dharmakhana, the non-manifest or "subtle" "Buddha body," "nature" or "essence," equivalent to ultimate reality, sunyata or emptiness of thought and substance. Thus, Borobudur still withholds some of its secrets despite the great advances of modern research. All the Buddhas, significantly, face outward towards the world in keeping with the temple's primarily didactic mission.



The texts illustrated on Borobudur's 2670 bas relief panels (1460 of them narrative, the rest decorative) in two registers on the walls and balustrades of its four concentric, redented terraces seem deliberately selected and sequenced to illustrate the three dhatus, lokas or "realms" of Buddhist cosmology, subdivided into thirty-three (or thereabout,) ranked levels of consciousness, (see appendix I, "Buddhist Cosmology.") The original base, (now hidden by a "false foot," added when the temple began to subside under its own massive weight,) the 1st terrace and the balustrade of the 2nd, depict events from the *kamadhatu*, the ten "desire worlds" inhabited by humans as well as the Vedic gods and demons. The panels on the three upper terraces are taken from the Gandavyuha, (The Structure of the World Compared to a Bubble or The Entrance into the Dharma) which constitutes the 39th chapter of the Flower Ornament Sutra and its sequel, the Bhadraari Sutra. These are important, if obscure, Mahayana texts describing the guest for enlightenment of a youth, Sudhana, in the course of which he is instructed by no fewer than fifty-two "good friends," gurus, bodhisattvas and Buddhas, populating the rupadhatu, the eighteen "form worlds" of those who are no longer subject to cataleptic desires, experiencing only self-delight, but still occupy discrete territory in space and a unified consciousness capable of instructing others. On the fifth terrace bas reliefs are replaced by Buddhas in lattice-work stupas or dagobas, some with square, some with hexagonal matrices, which presumably represent the arupadhatu, the four "formless worlds" of beings who have transcended individual form and spatial dimension; since they therefore cannot be represented, they are bracketed in a kind of "architectural parenthesis" or "under erasure," partially visible within the dagobas as Buddhas withdrawn in meditating on the emptiness of their own meditations.



EKAMUKHALINGA (SINGLE-FACED SHIVA LINGA,) LOP BURI, NATIONAL MUSEUM, BANGKOK (11TH CENTURY) To RIGHT -SHIVA, PHNOM BOK, ANGKOR (889-915,) MUSEE GUIMET

The *Devaraja* Cult

This guandary has led historians to speculate that these temples may have existed primarily as ceremonial centers without a congregational or monastic function, similar to the Achaemenids' Persepolis or the Zapotecs' Monte Albán. The most obvious candidate for such a purpose is the abhisheka or "empowerment initiation" into the much-debated devaraja cult, instituted, according to the Sdok Kak Tham inscription (1053 C.E.,) by Javavarman II in 802 on Mt Kulen. From a closer reading of the epigraphic evidence, it now seems likely that the devaraja did not refer to the king but a portable, perhaps wooden, linga or totem through which the king communed with the god during an occult ritual. This was performed on the upper terrace of his state temple mountain, perhaps a substitute for Mt. Kulen. a brahmin from a specific lineage, (in the sense of gotra or clan rather than parampara or "guru lineage.") These intentionally obscure inscriptions suggest the devaraja could have functioned like a Vajrayana yidam or personal deity, through whom the king "presenced" or envisioned his metaphysical or "subtle body," an Ayurvedic and later Tantric concept mediating corporeal emanation his and his non-manifest essence,""Buddha nature" or dharmakhana, vaquely equivalent to the "soul" or "holy ghost" in Christianity. This periodic entheogenesis allowed the king to transmit the darshan or blessing of an awakened god to his subjects and kingdom.

This tends to support the thesis that a primary attraction of Hinduism to the feudal regimes during the initial contact period was its concept of the *chakravartin* or "Lord of the Universe," a Saivite epithet, which seems to have been syncretized with indigenous South Asian traditions of the king as an intermediary between his subjects and the gods, notably his own deified ancestors. This belief was reinforced by the ten avatars of Vishnu, the *Dashavatara*, (see appendix **VI**) the eighth of which, Rama, the eponymous hero of the *Ramayana*, was both a model of the ideal sovereign and a god in mortal guise. This interpretation is lent credence by the posthumous names adopted by all Khmer kings on the supposition that after death they would rejoin the deity of whom they had been an avatar, "channel" or protégé. Thus, a Khmer king did not just rule through divine right but through divine role as the human embodiment of his titular deity.

It seems logical that in many cultures, kings would tend to confuse themselves with deities and find mortality so out of character and unnatural that it surely could be circumvented. Some scholars have therefore hypothesized a funerary function for these temples, despite the lack of evidence anyone was ever buried there, to say nothing of the fact, that both Hinduism and Buddhism incinerate rather than inter their dead. Nonetheless, there is no shortage of precedents; the pyramids of Giza certainly demanded as much labor from the pharaoh's subjects as the temple mountains of Angkor to assure their mummified remains a safe passage through the perilous underworld until they could reign again. Shah Jahan prepared the marble Taj Mahal for his wife (and its unbuilt onyx counterpart for himself) to be sure a proper Paradise awaited them on the Day of Judgment. Could Angkor's temples have been, built in preparation for their sponsors' posthumous apotheosis, "temples-in-waiting," as it were? If they were primarily expressions of the reigning monarch's pretensions to immortality, it might explain why these literally monumental efforts were so readily abandoned and forgotten. For example, the masons at Ta Keo seem to have dropped their chisels the moment its future occupant could no longer sign their paychecks; his successor tried to give this second-hand mausoleum to a brahmin who declined it, after which it went unvisited until a French naturalist stumbled across it 850 years later. If it was a cenotaph, the anomalous westward orientation of Angkor Wat might not just be a consequence of its dedication to Vishnu but because west is also the direction of death. In Pure Land Buddhism, the devout are borne at death directly to the "blessed Western Lands" by the Mahayana Buddha, Amida or Amithabha, whose avatar, the bodhisattva, Avalokitesvara or Lokesvara in Khmer, just thirty year later, became the titulary deity of Preah Khan and one candidate for the Bayon's face towers.

Temple Mountains in "Mandala" or "Molecular" Polities

The lack of any obvious purpose for these temples has suggested to some that they were their own point: a demonstration of a ruler's power to command the immense resources needed for their construction. In other words, their point was to make or mark a point, a center from which the king's spiritual and temporal authority radiated, as the empire's influence flowed along the roads from the capital to its peripheral outposts, remote temples like Phimai, Preah Vihear and Phnom Chisor, all oriented back towards Angkor. Obvious analogies would include Rome, to which all roads led as caput mundi and where all distances were measured from the *millarium aureum* in its Forum. Similarly, the *mihrab* in every mosque and every Muslim in his five daily *salats* or prostrations point along the *qibla* axis to Mecca. The need for such symbolic markers and their magnitude might, ironically, increase the more the actual lines of authority became frayed, attenuated and ambiguous. At least that is the contention of archaeologists John M. Miksic and Geok Yan Goh in Ancient Southeast Asia (Routledge, New York, 2017,) who argue that the "Eurocentric," early modern model of a highly centralized state, directly administered by a bureaucratic apparatus with unquestioned loyalty to an absolute monarch, anointed by god and primogeniture, exemplified by the ancien regime in France, is inappropriate for the feudal context of Southeast Asia in the 1st millennium. (The problem would then not seem to lie in its "Eurocentrism" but its "modernity;" feudal France approximates their model; even the "Sun King" had his Fronde.) They propose, instead, a "mandala model" where sovereignty derives from recognition of a ruler's authority as chakravartin, the current incarnation of dharma or divine law which rippled out in widening circles to more distant, paler manifestations of his authority - the regional nobility, the heads of local clans and magnates. A ruler's power was therefore contingent on his recognition by similarly entitled, semi-autonomous elites, often from rival ruling families, and demonstrated through the unreliable payment of tribute and military service, rather than direct taxation collected by royal agents. The monarch, in turn, was obliged to manifest his legitimacy through munificence in the form of the construction of the region's pre-eminent religious monuments and civic improvements. This pattern could be seen as paralleling Deleuze and Guattari's theory of "molecular sovereignty" in which overlapping, semi-independent, administrative power centers, ("bureaucratic fiefdoms," for example,) are locked in a more or less continual competition with each other and the central authority to maintain their autonomy.

In this perspective, Khmer state temples, *barays*, roads, bridges, rest houses, hospitals and regional shrines would be the explicit signifiers of implicit lines of a centripetal force binding far-flung dependencies to the capital, when in fact the suzerainty they signified so conspicuously was always drifting, fluid and provisional because exercised through quasi-autonomous feudatories. At the blurred perimeters of these mandalas, rival power centers vied to attract the allegiance of the most distant and hence least tightly bound local lords, while ambitious epicycles circling the center of a mandala always threatened to expand their orbits to become new suns. The Khmer Empire was, in fact,

fraught with what appear to have been periodic contested successions and dynastic challenges from provincial centers in 928, 944, 1001-1010, 1080, 1113, 1165-1177, 1181, 1243 and 1295. This tendency was exacerbated by an ill-defined, avuncular line of royal succession which could always bypass a ruler's sons in favor of his mother's male relatives. These periods of instability would eventually end with the emergence of a dominant central authority determined monarchs such as Rajendravarman, Suryavarman I, Suryavarman II and Jayavarman VII - who could tame obstreperous, regional warlords, impose a standard code of law and levy fixed taxes collected by royal functionaries before they could be siphoned off by local oligarchs. With the passage of time, however, royal revenues would become depleted precisely as a consequence of the grandiose monuments and pious, tax-exempt religious endowments expected of a legitimate *chakravartin*, providing restive, rival dynasts an opportunity to start the cycle again, plunging the empire into protracted, internecine conflicts, such as those responsible for the sack of Angkor by the Cham in 1177 and by the Thai of Ayatthuya in 1352 and 1393, which led to the abandonment of Angkor and the removal of the capital to the comparative safety of Phnom Penh.

Evolution of the Temple Mountain at Angkor



Borobudur proved a heteroclite, a prototype without copies; perhaps it so fully realized the potential for a monument to be both a mandala and a mountain no Indian or Khmer ruler was devout or ambitious enough to be tempted to surpass it. The Ananda Temple (1050-1100 C.E.) at Bagan, for example, has 1500 Buddhas lining the 15m tall walls of its two interior corridors – the equivalent of internal terraces – while its upper terraces are lined with 547 plaques illustrating each of the *jataka* or "birth stories" of Buddha's previous incarnations. Most, however, are too high for anyone to see, since the temple was built for "merit," credit against the monarch's karmic debt, not for the edification of his subjects. This may reflect the difference between Ananda's Theravada Buddhism, where release is earned over many reincarnations and the Mahayana possibility for enlightenment

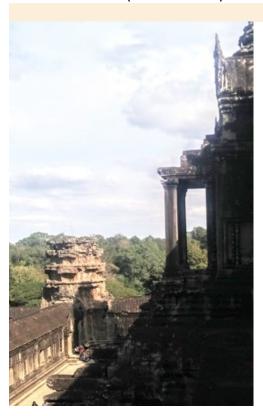
in a lifetime illustrated at Borobudur. The immense Khmer temple mountains documented in this album also don't emulate Borobudur's welldefined didactic purpose; their terraces may be larger but we still don't know what their use was; their bas-reliefs depict a gallimaufry of monarchical glorification, recent history and episodes from the two Hindu epics but lack Borobudur's step-by-step curriculum for novice bodhicittas. There is no sign the builders of the Baphuon or Angkor Wat were even aware of their illustrious predecessor. In many ways, Angkor Wat seems almost the antithesis of Borobudur whose solid mass might have struck Khmer builders and kings as merely squat or squashed and inappropriate for the ordered spaciousness of an expanding empire. At Borobudur the architects seem deliberately to have constructed a confined, linear and ultimately private experience of space between its walls and balustrades, unspooling like a film around each redented corner, twisting but climbing steadily upward along an unfolding path towards a conclusion that could only be experienced by reaching it. In this labyrinth, one can imagine, initiates could gradually shed their samsaric illusions of occupying a personal position in architectural and terrestrial space, erasing the dualism of here and there, self and other. The uneventful, often repetitious, story of Sudhana and his fifty-two "friends" numbs the scopophilic gaze grasping for exciting drama, pomp and opulence, so amply rewarded in Angkor Wat's 1st gallery; it is often difficult to link the carvings on Borobudur's upper tiers to the Gandavyuha's text because the scenes differ so little. When adepts finally emerged on the upper terrace, their attention would not have been directed at an expansive vista around them framed by open colonnades, the imperial domain stretching to the Cambodian plain's horizon, instead they would have seen the volcanos hemming in the Javanese temple. In any event, had they followed Sudhana's lessons closely, facing from away them, squinting cramped dagobas with their Buddha statues in teaching mudra, pointing out the emptiness of the external world to a spaciousness not of the eye. As the pilgrims circled the three narrowing rings of dagobas, the landscape always at their back, their view would be directed upward by the stupa with its vacant chambers, tapering until it disappeared at its dimensionless apex.

This contrasts markedly with the spatiality created at Angkor Wat and the Baphuon with their scenographic evocation of an ideal mountain range, each peak hierarchically aligned around the central *shikhara*, the summit of Mt. Meru, a comprehensible monumentality in which they were clearly situated. This order extended outward, not just inward, beyond the temple's enclosures to the surrounding plain, aligning in its orthogonal grid the great *barays*, canals and roads stretching to the furthest limits of the Khmer realm, reminded at each point along the way by a replica of the gigantic Khmer *prasat* at its center. The temple's designers created a crisply defined, classically balanced alternation of negative and positive spaces, where the location of any part within the whole could be inferred from its relationship to the hierarchy of galleries arrayed around the central tower, where the *devaraja* cult was enacted and, for that moment, the god made his

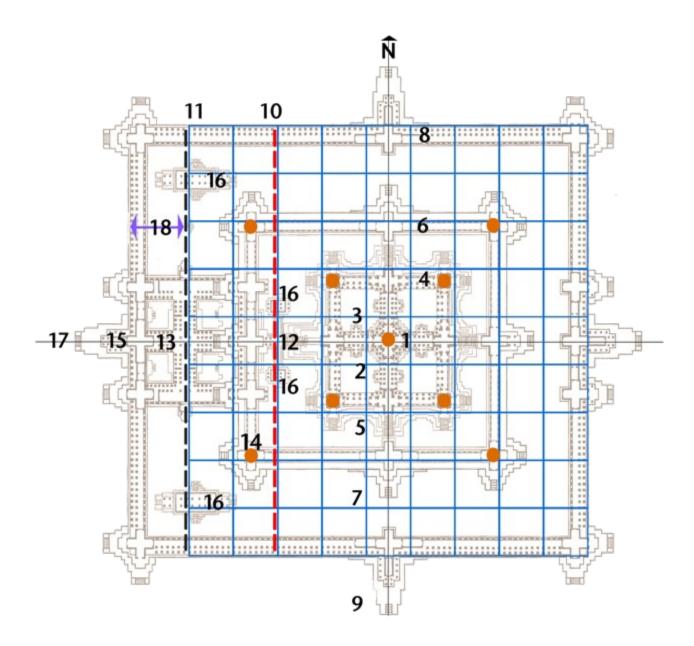
home. The time would come – in only thirty years – when this seemingly immutably structured universe would rupture and collapse, perhaps replaced by something more alien than Borobudur's Mahayana Methodism – the Vajrayana trance and out-of-body experience which is the Bayon.

Beyond aesthetic preferences and dynastic vanity, there were no doubt more prosaic factors which contributed to Angkorian indifference to such a conspicuous Javanese prototype. Khmer kings prior to Jayavarman VII (1181-1220 C.E.) were officially Hindu, as were their temples, so Borobudur might not have seemed an appropriate model. There is evidence that the Sanjavas' Hindu shrines at Prambanan did influence earlier Khmer temples, including their basic shrine or *prasat* module (or aedicule) and the tendency to project free-standing replicas around it. Moreover, Khmer temples may have served a symbolic rather than didactic function and symbols lose their aura the more the implicit is made mundanely explicit. While the theological program of Borobudur has gradually divulged itself to scholarly inquiry, the purpose of Angkor's "temple mountains" still largely eludes us.

VIEW TO THE NORTHWEST, 3RD TERRACE, ANGKOR WAT (1113-1150)







Books have been written to explain the many enigmas of Angkor Wat. Some have argued that it faces west rather than the more orthodox east because it was dedicated to Vishnu who was associated with that direction, and its commissioner, Suryavarman II's, posthumous name was Paramavisnuloka, an avatar of that deity. Others have contended it was a funeral monument like the pyramids of Giza because the west was traditionally associated with sunset, death and a return to the dark womb – or "womb chamber," the garbagriha. Archaeologists have more recently suggested the temple may have functioned as an observatory, since the king was named after the Vedic sun god, Surya, and have painstakingly counted the number of windows, columns and steps between every part of the temple to demonstrate they were calibrated with the path of the sun or moon. Angkor

Wat assuredly symbolized Mt. Meru, center of the Hindu universe, like every other :temple mountain," but it has also been suggested it might have represented Mt. Mandara, the legendary pivot Vishnu used in the "Churning of the Ocean of Milk" to coagulate the elixir (butter?) of immortality in one of the most often illustrated Khmer myths. The city and empire swirling around this temple mountain at its center would then re-enact each day the same mythopoeic urbanism as the bridge and moat around Jayavarman VII's Angkor Thom, a symbol of the prosperity resulting from industrious cooperation by the empire's diverse people. This myth, in fact, is illustrated in the celebrated bas relief murals of the southern half of its 1st eastern gallery, while nearby, in the western half of its southern gallery, is a procession of Suryavarman II's court and army, perhaps to suggest a parallel. Between the two, however, is a carving of the heavens and narakas, the gruesome hells; did these demonstrate the rewards and punishments meted out to those who embraced or rebelled against the murals' symbolic messages? The following few paragraphs of analysis do not attempt to resolve such conundrums rather they use Angkor Wat to synthesize or knit together two threads in the evolution of Khmer temple mountain architecture which have emerged in this introduction – asymmetry and cruciform expansion.

There is no dispute that the temple is the largest stone building and religious structure ever built or that Angkor Wat was not its name, however apt it is may seem - a macaronic Sanskrit-Khmer phrase, hybrid like its architecture, meaning "the city in the shape of a temple." It is difficult today, when the temple sits in isolated splendor within a landscaped archaeological park, to imagine it the hub of an intensively cultivated conurbation, divided into orthogonal plots linked by an extensive network of canals and roads indicative of a high degree of central planning. The Aztec capital of Tenochtitlán, set in the middle of Lake Texcoco, surrounded by its so-called "floating gardens" or *chinampas* which so amazed Cortez in 1519 and still are visible at Xochimilco, may offer a more accurate picture of ancient Angkor than its scrupulously restored, but decontextualized, present monuments. The area immediately adjacent to the temple has been estimated to have had a population approaching half a million, making it one of the largest cities of its day. The temple's rigorous plan reached beyond the three terraces analyzed in the following diagrams, across the 82-hectar 4th enclosure, over the 190m moat to the other temples in the Angkor area and, beyond them, the major religious and commercial centers of the Khmer Empire - the temples at Beng Mealea, Banteay Chhmar, Phnom Chisor, Preah Vihear, Phnom Rung and Phimai. In 2015 over a billion LIDAR photographs of the Angkorian heartland confirmed that the temple's grid extended into the densely populated rural zones around it.

3RD OR UPPER TERRACE, ANGKOR WAT (1113 - 1150)



THE NARAKAS OR HELLS, 1ST GALLERY SOUTHEAST, ANGKOR WAT (1113 - 1150)

Muchhas been written to explain the many enigmas of Angkor Wat. Some have argued that it faces west rather than the more orthodox east because it was dedicated to Vishnu who was associated with that direction, and its commissioner, Survavarman II's, posthumous name was Paramavisnuloka, an avatar of that deity. Others have contended it was a funeral monument like the pyramids of Giza because the west was traditionally associated with sunset, death and a return to the dark womb - or "womb chamber," the garbagriha. Archaeologists have more recently suggested the temple may have functioned as an observatory, since the king was named after the Vedic sun god, Surya, and have painstakingly counted the number of windows, columns and steps between every part of the temple to demonstrate they were calibrated with the path of the sun or moon. Angkor Wat assuredly symbolized Mt. Meru, center of the Hindu universe, like every other :temple mountain," but it has also been suggested it might have represented Mt. Mandara, the legendary pivot Vishnu used in the "Churning of the Ocean of Milk" to coagulate the elixir (butter?) of immortality in one of the most often illustrated Khmer myths. The city and empire swirling around this temple mountain at its center would then re-enact each day the same mythopoeic urbanism as the bridge and moat around Jayavarman VII's Angkor Thom, a symbol of the prosperity resulting from industrious cooperation by the empire's diverse people. This myth, in fact, is illustrated in the celebrated bas relief murals of the southern half of its 1st eastern gallery, while nearby, in the western half of its southern gallery, is a procession of Suryavarman II's court and army, perhaps to suggest a parallel. Between the two, however, is a carving of the heavens and narakas, the gruesome hells: did these demonstrate the rewards and punishments meted out to those who embraced or rebelled against the murals' symbolic messages? The following few paragraphs of analysis do not attempt to resolve such conundrums rather they use Angkor Wat to synthesize or knit together two threads in the evolution of Khmer temple

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THE NARAKAS OR HELLS, 1ST GALLERY SOUTHEAST, ANGKOR WAT (1113 - 1150)

- 1. Vishnu shrine and central tower
- 2. 3rd (upper) terrace
- 3. Cruciform pavilions (4)
- 4. 3rd gallery (open colonnade)

- 5. 2nd (middle) terrace
- 6. 2nd gallery (apsaras)
- 7 1st (lower) terrace
- 8 1st gallery (bas relief murals)
- 9. 4th (outer) enclosure
- 10. 2nd terrace "threshold line" (broken red line)
- 11. 1st terrace "threshold line" (broken black line)
- 12. 2nd terrace "cruciform walkway"
- 13. 1st terrace "cruciform cloister"
- 14. Towers (9, shaded orange)
- 15. 3rd west triple *gopura* (liturgical entrance)
- 16. "Libraries" (4)
- 17. Causeway over 4th (outer) enclosure and gallery from the moat
- 18. Eastward offset

 $9 \times 9 = 81$ -pada paramasayika mandala

Angkor Wat has been described succinctly as a pyramid with three galleries (4, 6,10) around three terraces or levels (2, 5, 7) with a panchayatana or double guincunx of towers (circles) at its center and the four corners of its 3rd and 2nd terraces (2, 5) for a total of nine (a double quincunx.) The 1st terrace (7) is surrounded by a vaulted gallery (8) with an open, outwardfacing colonnade containing the renowned eight narrative bas reliefs, over 600m long and more than 2m high. These murals, unlike Borobudur's, do not follow any readily discernible sequence or didactic program; they may refer to scenes across the terrace or even points beyond the temple, terrestrial and sidereal, or to nothing but themselves. Behind this gallery, the wide lawn of the 1st terrace (7) is linked by a "cruciform cloister" (13) to the 2nd gallery (6) and terrace (5) which presents an austere contrast with the 1st, paved entirely in stone with towering, canyon-like walls, its somber atmosphere lightened only slightly by 1024 (210) apsaras, similar to aurai or wind nymphs in Greek mythology, carved on its galleries, each slightly individualized, denizens of a more ethereal world than the bellicose scenes depicted in the 1st gallery below. The 2nd terrace is in turn connected by a second, raised "cruciform walkway" (12) to the central staircase up to the west range of the 3rd terrace (2,) which climbs at a 70% incline from the shadowed depths of the 2nd terrace (5) to the open colonnade of the western gallery (4) of the 3rd terrace (2) with its spacious views of the surrounding city and countryside. The 3rd terrace (2) repeats the pattern and dimensions of the cruciform cloister, except its is an open "cruciform colonnade" whose arms lead via four cruciform pavilions (3) to the central tower (1) of the double panchayatana. This contains the temple's sanctuary or cella, a redented Greek cross with four porches, dedicated to Vishnu rising above from the 3rd terrace (2) in three stages, repeating the three levels of the temple pyramid itself and therefore, in a sense, an aedicule of it. The shrine is saptaratha, with seven redents or facets per quadrant, topped by a shikhara with five tiers or talas which repeat in ever-decreasing layers the outline of the shrine beneath them. It soars 213m above the 1st terrace, higher than the *flêche* of Notre Dame de Paris (prior to its incineration in April, 2019.)

The three terraces can as usual be associated with the three worlds, lokas or dhatus, of Hindu and Buddhist cosmology which also divide the terraces at Borobudur and the Baphuon; in Hinduism, the underworld, earth and heaven; in Buddhism, the kamadhatu or "desire realm," the world of myth, history and the Vedic gods, portrayed on the 1st gallery (8) bas reliefs; the rupadhatu or "form realm" of radiant, self-delighting creatures, symbolized by the apsaras of the 2nd gallery (6;) and the arupadhatu or "formless realm," states of pure awareness or energy, without form or location, perhaps suggested by the open colonnades (4) of the 3rd terrace. In a further analogy, the bas reliefs of the 1st gallery (8) could be correlated with or *samsaric* world profane of outward actions of (Theravada) dharma, the laws of right conduct; the apsaras of the 2nd, with the world of inward, self-reliant consciousness of the Mahayana sadhanas, yogas and meditative practices; leading to the 3rd, the Vajrayana or Tantric realm of "effective means," resulting in an experience of one's own transparency, sunyata or emptiness, and providing a glimpse of the "world beyond thought."

If a 9x9-pada paramasayika mandala is drawn over the 1st or lower terrace, its 1st and 2nd squares of 32 and 24 padas respectively will fill, on its west, the space between the "threshold lines" of the 1st and 2nd terraces (11,12) and, on its east, the space between the 1st and 2nd galleries (8,6.) Similarly, its 16 devika padas will fill the area around the square 3rd terrace (2,) on the west, between the "threshold line" of the 2nd terrace and the gallery of the 3rd (10,4) and, on the east, between the galleries of those two terraces (6,4.) The 3rd terrace (2,) with the redented, cruciform shrine and shikhara (1,) occupy the nine middle or Brahma padas. The proportions of Angkor Wat's 1st terrace are roughly 53 x 46 or 86.78%, that is, 13.22% longer than it is wide. (For those who share the Khmer fascination with astronomy, it may seem more than coincidental that Angkor Wat's latitude is 13.24 N.) The temple displays the asymmetry of most other Khmer shrines, although because it faces west its north-south axis is set-back to the east. If "threshold lines" are drawn for the 1st and 2nd terraces, that is, at the point where that terrace's length equals its width (broken lines 10, 11,) the "threshold line" of the 1st terrace (11) falls midway between the western (outer) edges of the 1st and 2nd galleries (6,8) and equals the length of one of the arms of the square "cruciform cloister" (13) linking them. The "threshold line" of the 2nd terrace (10,) like that of the 1st, also falls at the edge of a second, smaller cruciform structure, an elevated "cruciform crosswalk" (12) linking the 2nd terrace with the lip or projection of the 3rd gallery (4.) This "cruciform crosswalk's" (12) northern and southern arms connect the two small "libraries" (16) of the 2nd terrace; its western arm

extends to the western (outer) edge of the 2nd gallery (6) and its eastern arm to the outer edge of the 3rd terrace's protuberance at the top of the stairs from the 2nd. The same, seemingly contrived, assemblage had already been noted on both the eastern and western sides of the 1st terrace of the Baphuon (4 on figure 16.) It may even have existed in embryo in the enclosure of the first Khmer temple mountain, Ak Yom (700-725) where a raised, T-shaped crosswalk leads from the primary or eastern entrance to the steps of the pyramid's 2nd level and connects two, small, facing guardian shrines (7 on figure **12.**) The equal arms of the "cruciform" walkway" (12) at Angkor Wat are, not coincidentally, half the length of those of its "cruciform cloister (13,) and, therefore, also half those dividing the quadripartite 3rd terrace (2) whose length and width are therefore twice those of the "cruciform walkway." Thus the 3rd terrace (2) is itself a square, "cruciform colonnade" isomorphic with the "cruciform cloister" of the 1st (13) and the only terrace to display four-way symmetry around the two axes. The three terraces' eastern quadrants form nested squares around the axial crossing; adding the asymmetrical sections on the west, however, the 1st and 2nd terraces (7, 5) form rectangles with proportions of roughly 5/9 and 2/3 respectively.

Angkor Wat can be divided by a modular unit with a remainder, a central feature of both Khmer and Indian architecture. The temple's structures are assembled from this unit and the remainder which then form a symmetrical sequence from west to east.(excluding the asymmetrical eastward off-set equal to two modular units.) Readers who thought elementary algebra was safely in their past may wish to skipthe remainder of this paragraph. The modular

unit is derived from the critical difference in most Khmer temples between its length (here 215m) and width (187m) - the distance between its western edge and its "threshold line" or 28m; the modular unit is half that length, which equals the distance between the temple's north-south axis and its midpoint,

or 14m, labeled "a" on the diagram at right. The difference between the temple's length and width, 28m, divides its length, 215m, into seven equal parts or 14a, for a total of 196m. This leaves a remainder of 19m which, if also divided into two parts, yields a unit of 9.5m, labeled "b" on the diagram.

Thus, the length of the temple can be expressed as 14a + 2b. Analyzing the temple from the west, since the threshold line of the 1st terrace is 2a long and falls on the crossbar of the cruciform cloister, the distance between the 1st and 2nd terraces' western edges, the width of the cruciform cloister, equals 4a. Since the difference between the 2nd terrace's length and width is half that of the 1st or 14m, the distance between its western edge and threshold line equals a and falls on the north-south arms of the "cruciform walkway;" so the total distance from the western edge of the 2nd terrace to the top of the central stairs to the 3rd is 2a. This formula could then have

been repeated for the 3rd terrace, producing a rectangle whose length was 1/2a longer than its width. The architects of Angkor Wat, however, decided that the 3rd terrace should be square and isomorphic with the cruciform cloister, therefore 4a wide and 4a long, centered on the axial crossing.

The half of the cruciform cloister east of the threshold line is 2a long; the "cruciform walkway" also 2a and the western half of the 3rd terrace, also 2a. leaving a gap between the eastern edge of the "cruciform walkway" at the top of the stairs to the 3rd terrace and the western edge of that terrace's colonnade of b. (12a + 2b = a side of the mandala square), the distance from the "threshold line" of the 1st terrace to that terrace's eastern wall; therefore 6a + b or half that, equals the distance from the "threshold line" to the north-south axis.) This gap is filled by the platform or lip projecting between the 1st west *qopura*, the central *qopura* of the 3rd terrace's western colonnade, and the top of the steps from the 2nd, (the eastern arm of the "cruciform walkway.") Continuing east along the west-east axis from the 3rd terrace, the distance between its eastern edge and that of the 2nd terrace must equal the difference between the "threshold line" of the 2nd terrace and the western edge of the 3rd, in other words, half the length of the "cruciform walkway" or a, *plus* the westward protuberance or b, thus a + b. The remaining distance between the eastern edges of the 2nd and 1st terraces would then equal the difference between the overall length of the 1st terrace or "3rd enclosure" and e temple, 14a + 2b, and the distance from its western edge to the eastern edge of the 2nd terrace, 4a (the cruciform cloister) plus 2a (the "cruciform walkway") plus b (the protuberance) plus 4a (the 3rd terrace) plus a + b (the distance between the eastern edges of the 3rd and 2nd terraces) or 11a + 2b, leaving 3a as the width of the 1st terrace on the east. Thus the length of Angkor Wat could be expressed as (aa/aa) (aa)(b)(aaaa)(ba)(aaa) with the parentheses representing the different structural units and the forward slash its asymmetrical eastward offset or threshold line, (11 on figure 17,) leaving the symmetrical sequence aaaabaaaabaaaa.

CHAPTERV

The Brahmanical Sky at the Angkor Wat-

ANGKOR ARCHITECTURE: CONNECTING THE EARTH WITH THE SKY WITH ARTICLES AND PAPERS OF DR SUBHASH KAK REPRODUCED AD-VERBATIM

Introduction: In this Dulogy, of which this is the II nd part, we describe how the kings of Khemer constructed these magnificent Temple structures with the help of that day engineering, architecture possibly imported from India and artisans also from there who had the experience of building such temples earlier on. To come to the Point: These structures resemble knowledge of ancient Hindu Astronomy and Celestial science of the Hindu Holy Books. This is the amazimg look of the Angkor sky today and when the temples were completed: THE BRAHMANICAL SKIES





Let us start off by examining the skies of Angkor the day the Temple Inauguration was performed by King Suryavarman II between 1113 and 1150

The 9 Graha Puja performed at Bantey Sarai(near Angkor Wat) 1200 years ago A paper piublished in academia.edu & Researchgate.net by Dr. Uday Dokras Ph D SWEDEN

Discovery that a Satyanarayan (9 Graha) Puja was performed on 22nd of April 967 AD at largest Temple in the world- Bantey Sarai part of the Angkor Vat complex.

In Planetary clustering and navagraha at Banteay Srei , Scientist Asger Mollerup found that an inscription at Prasat Banteay Srey, 15 km north of Angkor Wat in Cambodia, dates the inauguration of this Shivaite sanctuary to coincide with a planetary alignment. A planetary clustering or planetary alignment is when the five planets visible to the naked eye are observable at dawn or dusk above the eastern or western horizon. The five planets form together with the sun, the moon, Rahu and Ketu the Indian concept the Navagraha. A close gathering of the five planets is an impressive celestial event and has been described in ancient Indian and Chinese records and calculations.

https://www.academia.edu/41864223/

Planetary_clustering_and_navagraha_at_Banteay_Srei

The Navagraha Pooja is a time tested vedic ritual to enable the performer to attain success in his life path and enable him to be the benefactor of good things and deeds. The pooja is worship of 9 planets on the natal chart of the person as well as in the heavens(skies) that control our deeds desires and results and outcomes of the same. The pooja creates a favorable ambience in the context of the present and future of the persons performing and guide them to success.

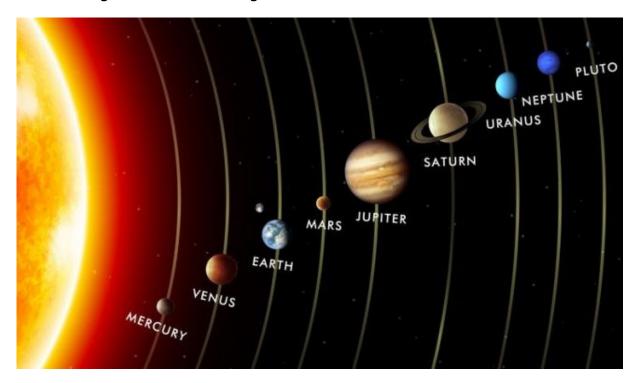
Bantey sarai part of the Angkor Wat complex, on the other hand, a -UNESCO world heritage site - is an enormous temple complex located in northern part of the country Cambodia in South East Asia. It was originally built in the first half of the 12th century as a Hindu temple in the form of a mandala dedicated to God Vishnu on a site 400 sq acres. In those ancient days, to commemorate the inauguration of the Bantey sarai part of the Angkor Wat- largest Hindu temple in the world to Lord Śrī Tribhuvanamaheśvara-a Satyanarayan (9 Graha) Puja was performed when the 9 planets were actually visible to the eye. An inscription presenting the astronomical setting when the main deity of the shrine was consecrated, has been discovered 15 km north of Angkor Wat in Cambodia. At Bantey sarai as contemplated by Asger Mollerup Independent scholar. This event he says is is mentioned in the inauguration inscription of the Sivaite Prasat Banteay Srey, not Angkor. The inscription is dated not in numbers but by a description of the celestial sphere, which he reconstructed.

Dr Uday Dokras, Nagpur's erudite Hindulogist and Vastu Purusha mandala (Astrology) expert believes that Venus-Jupiter conjunctions are not rare; but beautiful. Two examples occured in 2019- 24 January and 24th of November at dusk. A very close encounter between Venus and Jupiter will also occur on 2 nd May 2022 when the two planets will rise at 03:23 (local time). In the end of May, 2022, four of the five-planets of the navagraha will be visible on the night sky every night, culminating on 29 th May when Mercury and the moon joins the celestial show before dawn.

According to Asger Mollerup The most magnificent celestial show of this century will take place after dawn the 8th of September 2040, when the moon will resemble that on the matted hair of God Shiva and all 9 planets grouped together with the Planetary clustering of a navagraha.



The waning crescent adorning the hair of Lord Shiva



Every **scientific theory** starts as a hypothesis. A scientific hypothesis is a suggested solution for an unexplained occurrence that doesn't fit into a currently accepted scientific theory. In other words, according to the Merriam-Webster Dictionary, a hypothesis is an idea that hasn't been proven yet. If enough evidence accumulates to support a hypothesis, it moves to the next step — known as a theory — in the scientific method and becomes accepted as a valid explanation of a phenomenon.

Ancient Indians and mathematicians developed many such hypotheses and made observations to either accept or reject their hypotheses. They regularly measured things such as in which part of the sky the so called navagrahas were to be seen, tracked down their movements such as trajectory, degree etc. They noted down these and performed mathematical calculations. If you have certain good number of observations, as per statistics you may use the outcomes of the calculations to either accept or reject your hypothesis. Note that theories evolve and change over time. They are not set in stone. As new evidence comes out theories often change. Among many other things, ancient Indians had developed algebra to perform calculations. The picture below is of Aryabhata, the person who created the number zero. He was born in 476 AD. His contributions include Place value system and zero, Approximation of π , Trigonometry, Indeterminate equations, Motions of the solar system, Eclipses, Sidereal periods, Heliocentrism. For his explicit mention of the relativity of motion, he also qualifies as a major early physicist.

Aryabhata correctly insisted that the earth rotates about its axis daily, and that the apparent movement of the stars is a relative motion caused by the rotation of the earth, contrary to the then-prevailing view, that the sky rotated. This is indicated in the first chapter of the Aryabhatiya, where he gives the number of rotations of the earth in a yuga, and made more explicit in his gola chapter.

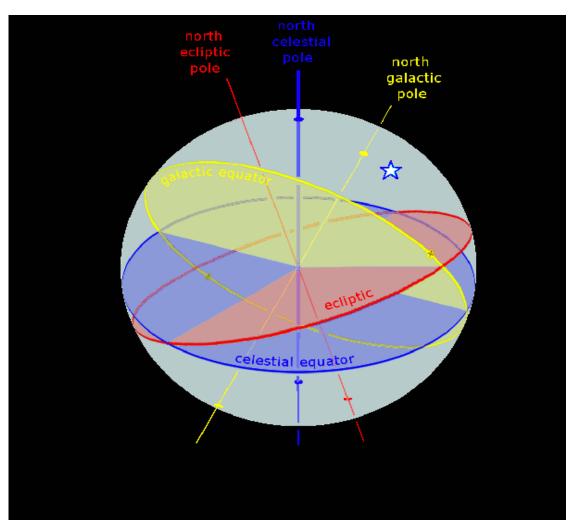
Because they did have access to some technology.

Ancient indians also had instruments to observe things. A living example of this is the current Jaipur Jantar Mantar, Jaipur, INDIA a collection of nineteen architectural astronomical instruments and is currently a UNESCO World Heritage site. The observatory consists of nineteen instruments for measuring time, predicting eclipses, tracking location of major stars as the earth orbits around the sun, ascertaining the declinations of planets, and determining the celestial altitudes and related ephemerides.



LEFT Jantar Mantar Observatory at Jaipur, India and on the RIGHT ancient Hindu astronomer Aryabhrata

Jantar Mantar deploys all three ancient coordinate systems of the five celestial coordinate systems known. In the image above, the red (ecliptic) and blue (equatorial) coordinate systems are two of the three classical systems that feature in the monument's instrument.



Many references of ancient scientific instruments used by Ancient Indians have been found. See example below.

Over the past two decades, researchers have made a number of discoveries related to the Angkor temples, including a moats and town built near the temple - a study showing how water can make blocks easier to move the stone blocks which must have been cut in that rectangular shape at the quarry itself.

CAN WE LEARN ANYTHING ABOUT THE ANGKOR WAT BY COMPARING IT TO THE BUILDING PROCESS OF THE PYRAMIDS

The logistics of construction at the Temples site are staggering when you think that. The main materials used to construct Angkor Wat were sandstone and laterite (a clayey soil and rock material rich in iron and aluminum). Sandstone was used as the main material for visible parts of the temple. Laterite was mainly used for the hidden structures. The dimensions are extremely accurate and the site was leveled within a fraction of an inch over the entire site measuring 162.6 hectares ($401+\frac{3}{4}$ acres). At the centre of the temple stands a quincunx of four towers surrounding a central spire that rises to a height of 65 m (213 ft) above the ground. [5] The temple has three rectangular galleries, each raised above the next. It lies within an outer wall 3.6 kilometres $(2+\frac{1}{4})$ miles) long and a most more than five kilometres (three miles) long. The temple was built at the behest of King Survavarman II, in the early 12th century in Yasodharapura present-day Angkor, the capital of the Khmer Empire, as the state temple for the empire. Originally constructed as a personal mausoleum for Suryaman, dedicated to the Hindu god Vishnu in the early 12th century, it was converted to a Buddhist temple towards the end of the 12th century.

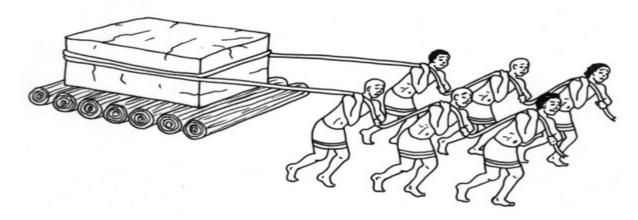
Angkor Wat combines two basic plans of Khmer temple architecture: the temple-mountain and the later galleried temple. It is designed to represent Mount Meru, home of the devas in Hindu and Buddhist cosmology. Unlike most Angkorian temples, Angkor Wat is oriented to the west. Scholars are divided as to the significance of this. The temple is admired for the grandeur and harmony of its architecture, extensive bas-reliefs, and statues of Buddhas and Devas that adorn its walls. This is comparable to the accuracy possible with modern construction methods and laser leveling. That's astounding. With their 'rudimentary tools,' the were about as accurate as we are today with 20th-century technology.

This required a level of labor force which dwarfs what modern day construction teams would need for comparable projects. Their organization and management would have needed to have been incredible to simply pull this effort off.

The stones involved in the building were not little bricks or lightweight breezeblocks. These stone- bricks vary in size but the largest can be found in the Gopuram. These particular stones differ from the regular limestone blocks and were instead made of granite, weighing between 25 to 80 tonnes. Centuries after the construction of Cambodia's Angkor Wat, archaeologists have uncovered traces of a series of canals that suggest the 5

million tonnes of sandstone used to build the temples took a far shorter route than previously thought.

The sandstone blocks each weigh up to 1.5 tonnes and originate from quarries at Mount Kulen. It was thought they were taken 35 kilometres along a canal to Tonlé Sap Lake, rafted another 35 km along the lake, then taken up the Siem Reap River for 15 km, against the current. Thinking this was unlikely, Etsuo Uchida and Ichita Shimoda of Waseda University in Tokyo, Japan, used satellite images to search for a shortcut. The canals they discovered led from the foot of Mount Kulen to Angkor – a gentle 34-km route, as opposed to the arduous 90-km trek previously suggested. The pair also uncovered more than 50 quarries at the foot of Mount Kulen and along the route. The stones they found matched those in the temples (Journal of Archaeological Science, doi.org/jhf).



The monument was made out of five to ten million sandstone blocks with a maximum weight of 1.5 tons each. The entire city of Angkor used far greater amounts of stone than all the Egyptian pyramids combined, and occupied an area significantly greater than modern-day Paris. Moreover, unlike the Egyptian pyramids which use limestone guarried barely 0.5 km $(\frac{1}{4})$ mi) away all the time, the entire city of Angkor was built with sandstone guarried 40 km (25 mi) (or more) away. This sandstone had to be transported from Mount Kulen, a quarry approximately 40 kilometres (25 mi) northeast. The route has been suggested to span 35 kilometres (22 mi) along a canal towards Tonlé Sap lake, another 35 kilometres (22 mi) crossing the lake, and finally 15 kilometres (9 mi) against the current along Siem Reap River, making a total journey of 90 kilometres (55 mi). However, Etsuo Uchida and Ichita Shimoda of Waseda University in Tokyo, Japan have discovered in 2011 a shorter 35-kilometre (22 mi) canal connecting Mount Kulen and Angkor Wat using satellite imagery. The two believe that the Khmer used this route instead.



Devata Sculpture on Wall at Angkor Wat

Virtually all of its surfaces, columns, lintels, and even roofs are carved. There are kilometres of reliefs illustrating scenes from Indian literature including unicorns, griffins, winged dragons pulling chariots as well as warriors following an elephant-mounted leader and celestial dancing girls with elaborate hairstyles. The gallery wall alone is decorated with almost 1,000 m² (11,000 sq ft) of bas reliefs. Holes on some of the Angkor walls indicate that they may have been decorated with bronze sheets.

While excavating Khajuraho, Alex Evans, a stonemason and sculptor, recreated a stone sculpture under 1.2 metres (4 ft), this took about 60 days to carve.

Roger Hopkins and Mark Lehner also conducted experiments to quarry limestone which took 12 quarrymen 22 days to quarry about 400 tons of stone. The labour force to quarry, transport, carve and install so much sandstone must have run into the thousands including many highly skilled artisans. The skills required to carve these sculptures were developed hundreds of years earlier, as demonstrated by some artefacts that have been dated to the seventh century, before the Khmer came to power.



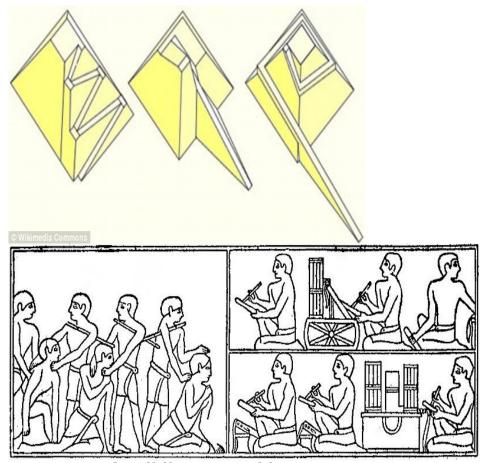
4 Books by the author Dr Uday Dokras on ancient Kambujdesh or Cambodia

Whether limestone bricks or granite slabs, the way to transport the materials over land and water. The leading theory as to how this would have been achieved lies in rolling the stones using a cradle-like machine. This suspended the rocks and allowed them to be rolled by a team of workers.

Experiments regardingthe constgruction of the pyramids done by the Obayashi Corporation, with concrete blocks 0.8 m square by 1.6 m long and weighing 2.5 tons, showed how 18 men could drag the block over a 1-in-4 incline ramp, at a rate of 18 meters per minute.

There is a general consensus that this method may have been effective in transporting 2.5 tonne limestone blocks, but it is difficult to find archeological evidence to suggest it would have been used for the 80 tonne granite slabs. mThis theory is elucidated in Dick Parry's text Engineering the Pyramids, but not everyone is in complete agreement about the effectiveness of this method.

To bind the rocks together, the Angkorians used mortar much like in modern building processes. Evidence points to the using of gypsum mortar – also known as plaster of Paris – in constructing.



Sequence of Building Pyramids

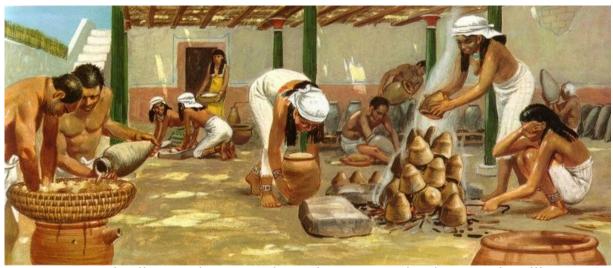
The construction of these great mausoleums was a gargantuan task which required a city's worth of labor and skilled craftsmen to boot. The slave myth

From what we've known about the pyramids we understand that teams of knowledgeable laborers would have been beneficial to create these structures. The building sites of ancient Egypt weren't simply hordes of poorly educated slaves to-ing and fro-ing chunks of rock, but areas where skilled and specialized laborers plied their trade under the supervision of architects and engineers. The following passage presents an accepted perception of workforce makeup:

Evidence suggests that around 5,000 were permanent workers on salaries with the balance working three or four-month shifts in lieu of taxes while receiving subsistence "wages" of ten loaves of bread and a jug of beer per day. Zahi Hawass believes that the majority of workers may have been volunteers. It is estimated that only 4,000 of the total workforce were labourers who quarried the stone, hauled blocks to the pyramid and set the blocks in place. Same may have been happening here in the Cambodian sites.

Like other large construction projects, bureaucrats may have played a large role:

- 1. The vast majority of the workforce provided support services such as scribes, toolmakers and other backup services.
- 2. Moreover, teams could have been put together.
- 3. In the case of Egypt, tombs of supervisors contain inscriptions regarding the organisation of the workforce. There were two crews of approximately 2,000 workers sub-divided into named gangs of 1,000. The gangs were divided into five phyles of 200 which were in turn split into groups of around 20 workers grouped according to their skills, with each group having their own project leader and a specific task.
- 4. A Harvard Magazine article from Jonathan Shaw tells the story of how we found out the builders of the pyramids were not slaves, but workers:
- 5. It has beenfound the infrastructure which sustained the vast workforce committed to working on the construction of the pyramids. It started with finding a bakery and followed by finding a goat cemetery large enough to feed an army.
- 6. The vast expanses of temporary city serve to cater to construction project which was one of humankind's largest achievements up to that point.
- 7. We see huge numbers of workers supported by an artificially constructed town, who are in turn split over and over into small dedicated teams given specialized tasks.
- Additionally, given the physical and demanding nature of the work, these teams worked on a few months on few months off - like workers on a modern day oil rig, catering to human demands like family.
- 9. Who were the workers? These groups of workers would often, it seems, banded together.



10.Cambodian society may have been organized somewhat like a

feudal system, in which almost everyone owed service to a lord. The Egyptians called this "bak." Everybody owed bak of some kind to people above them in the social hierarchy.

None of these incredible feats of engineering would be possible without the levels of organization and management to support them.

Yet, organization doesn't exist in a vacuum.

It requires a series of social and cultural advances in order to operate on this scale. A hunter gatherer society would not be able to achieve this level of organization.

The Egyptians had a well documented writing system, a numerical system, and a series of hierarchical structures designed to meter out responsibility as and when it was needed.

Developing pyramid-building techniques

The techniques used to build the Angkor temples were developed over a period of centuries, with all of the problems and setbacks that any modern-day scientist or engineer would face.

Over 100-150 years ago, and it could be a trial and error method too. The architects running into trouble. Scholars generally regard the bent angle of a building as being the result of a design flaw-giving the structure a bent appearance. Then the architects would correct the flaw. Suryavarman II's son, Khufu, would use the lessons from his father and earlier predecessors to construct the "Great TEMPEL" the largest temple in the world.



DEVARAJA TRILOGY BY DR Uday Dokras

Planning the pyramids

The Devaraja must have appointed a high-ranking official to oversee many constructions. Researchers are working to understand the sophisticated planning that would have been involved in temple building, which required constructing

not just the main gopuram, but also the temples, boat pits and cemeteries located near the enormous structures.

Researchers have noted that the Khemerians had the ability to align structures to true north very precisely, something that may have helped in planning the pyramids.

Supplies and food

The many chanels surrounding the construction site(if they were built earlier and one cam guess that some of them were indeed so- to enable logistics) would have been used to bring in supplies, food and people. The limestone blocks, used in the outer casing of the were shipped from quarries to the temple sites within a few days using boat transport. The ordinary workers likely slept in simple dwellings near the construction site.

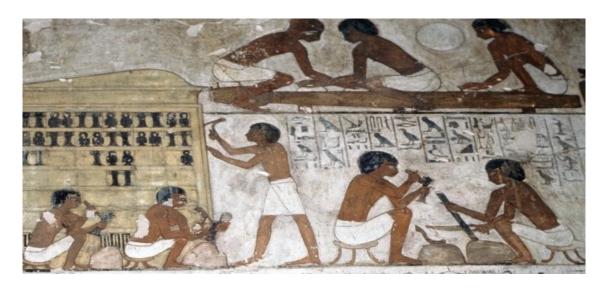
Estimates given by various archaeologists for the size of the workforce tend to hover around 10,000 people. These people were well-fed; enough cattle, sheep and goats must have been slaughtered every day to produce 4,000 pounds of meat, on average, to feed the builders. In a book "Proceedings of the 10th Meeting of the ICAZ Working Group 'Archaeozoology of Southwest Asia and Adjacent Areas'" (Peeters Publishing, 2013). A researcher- Redding- used the animal bone remains found at Giza, and the nutritional requirements for a person doing hard labor, to make the discovery.

Redding also found that animals were brought in from sites on the Nile Delta and kept in a corral until they were slaughtered and fed to the workersThe workers' meat-rich diet may have been an inducement for people to work on the temples. They probably got a much better diet than they got in their village.

Moving the blocks

To move the stones overland, the workers cpoul have used large sledges that could be pushed or pulled by gangs of workers. A team of physicists from the University of Amsterdam found in a study on the construction of the Pyramids, published in 2014 in the journal Physical Review Letters, had found that the sand in front of the sledge was likely dampened with water, something that reduced friction, making it easier to move the sledge. Something similar could have been tried here."It turns out that wetting Egyptian desert sand can reduce the friction by quite a bit, which implies you need only half of the people to pull a sledge on wet sand, compared to dry sand," Daniel Bonn, a physics professor at the University of Amsterdam and lead author of that study, had told Live Science in 2014. The scientists said scenes in ancient Egyptian artwork show water being poured in front of sledges.

Most Egyptologists agreed that when the stones arrived at the pyramids, a system of ramps was used to haul the stones up. However, Egyptologists are uncertain how these ramps were designed. Little evidence of the ramps survives, but several hypothetical designs have been proposed over the last few decades.



HINDU ASTRONOMY AT ANGKOR

Sunrise watching at Angkor Wat temple is one of the most popular activities in Siem Reap. Incredibly, when it comes to March and September, Angkor temple visitors have an amazing natural incentive which is **Angkor Equinox Events**. This is the **special Angkor sunrise rising just over the summit of central Angkor Wat tower**.

In March, the Northern Hemisphere welcomes a special natural phenomenon called Equinox. Since this equinox event is happening in March, the beginning of the Western Spring season, it is called March Equinox or Spring Equinox and another unmatched Vernal Equinox. Whereas for the later event happens in September, it is called Autumn Equinox.

Therefore - twice a year in March and September, the Angkor visitors welcome special Sunrises rising over the central tower of Angkor Wat temple in this Vernal Equinox in March and September in the 20s of each months. With this special natural phenomenon along with an astronomical architecture that Angkor Wat temple, is designed with these special days were named the **Angkor Equinox** (\(\) \(

"Quest for the Lost civilization", by Graham Hancock, is a fascinating documentary about the world's ancient monuments. By the minute 29:00 of the

video you can see the amazing scene of a very special sunrise at Angkor. The sun raises exactly on the peak of the main Angkor Temple. This only happens twice a year, at the so called equinox – time of the year when the sun crosses the plane of the earth's equator and day and night are of equal length. It is hard to believe how people were able to build up such amazing events already in ancient times.

SUNRISE AT ANGKOR WAT DURING THE EQUINOX IN CAMBODIA, INGA, 2013'

Archaeologist believe during ancient times kings wanted to connect the earth with the sky. Hence they used to integrate sky events to temples, not just at Angkor but all over the world. The equinox sunrise at Angkor Wat is only one of those. Researchers have found that the main route to Angkor Wat temple differs by three quarters of a degree from the east-west axis to the north. According to the precession of the earth's axis, the North Pole is not fixed but moves like a spiral. This happens extremely slowly. Around 72 years for each degree. It takes about 26,000 years for a complete revolution.

Multiplying the precession of the earth's axis – the aforementioned three quarters of a degree – with the number 72 results in the number 54. The number 54 is more frequent in Angkor Park. For example, the four-faced towers at the Bayon Temple or the guards in front of the South Gate of the city of Angkor Thom.²

THE EQUINOX IN CAMBODIA

In Cambodia, this astronomical event happens during Spring (around 20th of March), and during Autumn (around 23rd of September). Dates are:

PRIMARY EQUINOX

20.03.2017 um 17:29 Uhr 20.03.2018 um 23:15 Uhr 21.03.2019 um 04:58 Uhr 20.03.2020 um 10:50 Uhr

SECONDARY EQUINOX

22.09.2017 um 04:02 Uhr 23.09.2018 um 09:54 Uhr 23.09.2019 um 17:50 Uhr 22.09.2020 um 21:31 Uhr ³

UT date and time of equinoxes and solstices on Earth												
even t	equinox		solstice		equinox		solstice					
mont h	March		June		Septemb er		Decemb er					
year	da y	tim e	da y	tim e	da y	time	da y	tim e				
2016	20	04:3	20	22:3 5	22	14:2 1	21	10:4 5				
2017	20	10:2 9	21	04:2 5	22	20:0	21	16:2 9				
2018	20	16:1 5	21	10:0 7	23	01:5 4	21	22:2				
2019	20	21:5	21	15:5 4	23	07:5 0	22	04:1 9				
2020	20	03:5	20	21:4	22	13:3 1	21	10:0 3				
2021	20	09:3 7	21	03:3	22	19:2 1	21	15:5 9				
2022	20	15:3	21	09:1	23	01:0	21	21:4				

		3		4		4		8
2023	20	21:2	21	14:5 8	23	06:5	22	03:2
2024	20	03:0 7	20	20:5	22	12:4 4	21	09:2
2025	20	09:0	21	02:4	22	18:2	21	15:0 3
2026	20	14:4 6	21	08:2	23	00:0	21	20:5

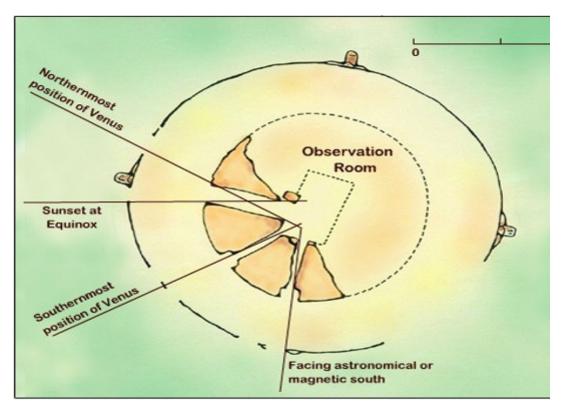


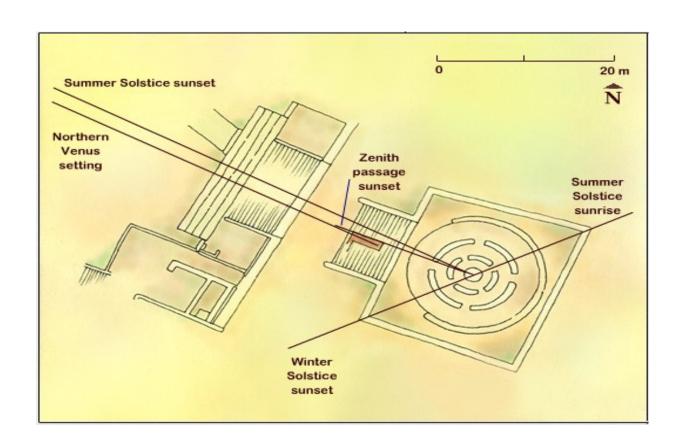
- 1. Illumination of Earth by the Sun at the equinox
- 2. The relation between the Earth, Sun, and stars at the March equinox. From Earth's perspective, the Sun appears to move along the ecliptic (red), which is tilted compared to the celestial equator (white).
- 3. Diagram of the Earth's seasons as seen from the north. Far right: December solstice.



4.Diagram of the Earth's seasons as seen from the south. Far left: June solstice.

Mayan Astronomy: The Maya went as far as to use their knowledge of astronomy to build and arrange their most important pyramids and temples around the equinox. These particular formations have been referred to as E-groups.







EL CASTILLOEl Castillo—in Spanish, "the castle"— looms at the center of Chichén Itzá, a 79-foot pyramid of stone. Also known as the Pyramid of Kukulkán, the structure embodies Mayan myth along with natural astronomical cycles.

The phenomenon that El Castillo is famous for occurs twice each year, at the spring and fall equinoxes. (In fact, the effect is viewable for a week before and after each equinox.) As the equinox sun sets, a play of light and shadow creates the appearance of a snake that gradually undulates down the stairway of the pyramid.

This diamond-backed snake is composed of seven or so triangular shadows, cast by

the stepped terraces of the pyramid. The sinking sun seems to give life to the sinuous shadows, which make a decidedly snaky pattern on their way down the stairs.

Thousands of people gather to see this phenomenon, which may have been viewed by



the ancient Maya as the manifestation of the god Kukulkán, the feathered serpent. But was the effect intentional, or merely a happy accident?

It isn't possible to read the minds of the Maya who built the structure in roughly AD 1000, but various signs suggest the effect was deliberately created. The most obvious of those signs are the large snake-head sculptures carved into the base of the stairway. As the shadow moves down the stairway, the body of the snake ultimately unites with one of these enormous heads.



Other features of El Castillo suggest astronomical understanding and intent on the part of the Mayan builders. The structure as a whole seems to be aligned with an important astronomical axis: The west plane of the pyramid faces the zenith passage sunset. Meanwhile, each of the four (exceedingly steep) stairways that climb the pyramid has 91 steps, with a final step at the top making a total of 365, the number of days in a solar year. Ninety-one is also the number of

days that separate each of the four phases of the annual solar cycle: winter solstice, spring equinox, summer solstice, and fall equinox.

Using the patterns of light and shadow appearing on El Castillo throughout the year, the Maya could easily have tracked the seasons and marked these four annual solar events—the two solstices and two equinoxes. And so it seems the ancient Maya may have used this structure as, among other things, a calendar to signal appropriate times to plant, harvest, and perform ceremonies. At the top of El Caracol's grand staircase is a tower, now rounded by decay, but originally in the form of one smaller cylinder stacked on a larger one. (Imagine a double-decker wedding cake.) To gain access to the uppermost tower, you have to walk through a narrow winding staircase. It is this staircase that earns the structure its name; *El Caracol* means "snail."

In the half-ruined higher tower of El Caracol, three openings survive. These three openings are small, narrow, and irregularly placed, suggesting that they are actually viewing shafts. It turns out that these windows do in fact align with important astronomical sightlines. Looking through these windows a thousand years ago, observers could have watched for Venus rising at its northern and southern extremes, as well as the equinox sunset. The three window shafts that remain in the upper tower of El Caracol seem to align with various celestial events on the horizon.

THE MOTIONS OF VENUS

Seen from the earth, Venus moves in a tricky fashion, appearing, disappearing, then reappearing, first as a morning "star," then as an evening "star." (Venus is a planet, of course, but observers in the past—persisting in some cases to the present—mistook it for an unusually bright star.) So complicated is Venus's disappearing act that the ancient Greeks misconstrued it as two different stars. The Mayans knew better, and they recognized Venus in both the morning and evening skies as one and the same.

If you were to watch the horizon at sunrise, you might first see Venus appear over the horizon just at daybreak. Each day, Venus would rise a little earlier, climb a little higher, and shine a little brighter, before its light was drowned out by the sun. Then the pattern would reverse, and Venus would rise a little later each day, until finally it would fail to rise.



This rise and fall of Venus as a morning star takes 263 days. For the next 50 days, Venus disappears and cannot be seen in the sky at all.

Then, Venus reappears in the evening sky, where it remains for another 263-day phase before disappearing below the horizon for 8 days. At the end of these 8 days, Venus reappears as a morning star, and the cycle begins again.

Mayan pictograph of Venus

The entire cycle—263 as a morning star, 50 days absent, 263 days as an evening star, and finally, 8 days absent—takes 584 days, an interval also known as the *synodic* period of Venus.

It just so happens that the synodic period of Venus (584 days) relates to the orbital period of the earth (365 days) in a relatively simple ratio of 5:8. Five times the synodic period of Venus (5 x 584 days) is 2,920 days. If you divide 2,920 by the 365 days in our year, you get 8. In short, the motions of Venus relative to our sun repeat almost exactly every 8 years. Eight years would have been a useful span of time for ancient sky-watchers, who relied heavily on natural cycles to mark time.

There is a simple way to track this 8-year cycle. Like the sun, the position of Venus against the horizon appears to shift with the seasons. Venus shifts north in the summer and south in the winter. Exactly how far Venus shifts each year depends on where it is in its 8-year cycle, but the extreme points in the back-and-forth oscillation are known as the northern extreme and the southern extreme of Venus. An observer will see

Venus rise at each of these extreme points once every 8 years. 4

The Brahmanical Sky at the Angkor Wat

" **Indian astronomy** has a long history stretching from pre-historic to modern times. Some of the earliest roots of Indian astronomy can be dated

to the period of Indus Valley Civilization or earlier. Astronomy later developed as a discipline of Vedanga or one of the "auxiliary disciplines" associated with the study of the Vedas, dating 1500 BCE or older. The oldest known text is the *Vedanga Jyotisha*, dated to 1400–1200 BCE (with the extant form possibly from 700 to 600 BCE).

Indian astronomy was influenced by Greek astronomy beginning in the 4th century BCE and through the early centuries of the Common Era, for example by the Yavanajataka and the *Romaka Siddhanta*, a Sanskrit translation of a Greek text disseminated from the 2nd century.

Indian flowered in the 5th-6th with Aryabhata, astronomy century, whose Aryabhatiya represented the pinnacle of astronomical knowledge at the time. Later the Indian astronomy significantly influenced Muslim astronomy, Chinese astronomy, European astronomy, and others. Other astronomers of the classical era elaborated who further on Aryabhata's include Brahmagupta, Varahamihira and Lalla. An identifiable native Indian astronomical tradition remained active throughout the medieval period and into the 16th or 17th century, especially within the Kerala school of astronomy and mathematics.

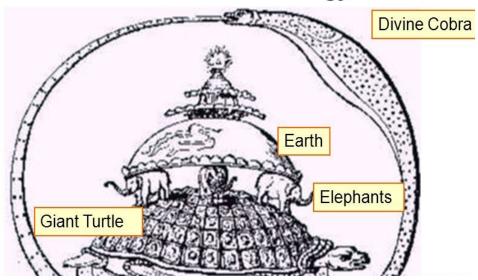
History

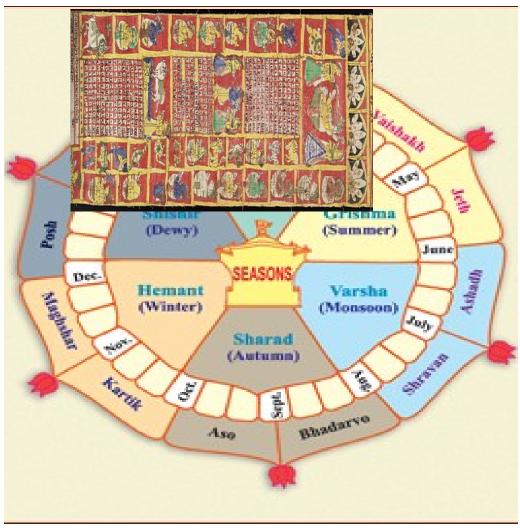
Some of the earliest forms of astronomy can be dated to the period of Indus Valley Civilization, or earlier. Some cosmological concepts are present in the Vedas, as are notions of the movement of heavenly bodies and the course of the year. As in other traditions, there is a close association of astronomy and religion during the early history of the science, astronomical observation being necessitated by spatial and temporal requirements of correct performance of religious ritual. Thus, the *Shulba Sutras*, texts dedicated to altar construction, discusses advanced mathematics and basic astronomy. *Vedanga Jyotisha* is another of the earliest known Indian texts on astronomy, it includes the details about the Sun, Moon, nakshatras, lunisolar calendar.

Greek astronomical ideas began to enter India in as early as the 4th century BCE following the conquests of Alexander the Great. By the early centuries of the Common Era, Indo-Greek influence on the astronomical tradition is visible, with texts such as the Yavanajataka and *Romaka Siddhanta*. Later astronomers mention the existence of various siddhantas during this period, among them a text known as the *Surya Siddhanta*. These were not fixed texts but rather an oral tradition of knowledge, and their content is not extant. The text today known as *Surya Siddhanta* dates to the Gupta period and was received by Aryabhata.

The classical era of Indian astronomy begins in the late Gupta era, in the 5th to 6th centuries. The *Pañcasiddhāntikā* by Varāhamihira (505 CE) approximates the method for determination of the meridian direction from any three positions of the shadow using a gnomon. By the time of Aryabhata the motion of planets was treated to be elliptical rather than circular. Other topics included definitions of different units of time, eccentric models of planetary motion, epicyclic models of planetary motion, and planetary longitude corrections for various terrestrial locations.

Ancient Hindu Cosmology





Hindu calendar in a nutshell: The divisions of the year were on the basis of religious rites and seasons (*Rtu*). The duration from mid March—mid May was taken to be spring (*vasanta*), mid May—mid July: summer (*grishma*), mid July—mid September: rains (*varsha*), mid September—mid November: autumn (*sharad*), mid November—mid January: winter (*hemanta*), mid January—mid March: the dews (*shishir*).

In the *Vedānga Jyotiṣa*, the year begins with the winter solstice. Hindu calendars have several eras:

- The Hindu calendar, counting from the start of the Kali Yuga, has its epoch on 18 February 3102 BCE Julian (23 January 3102 BCE Gregorian).
- The Vikrama Samvat calendar, introduced about the 12th century, counts from 56 to 57 BCE.
- The "Saka Era", used in some Hindu calendars and in the Indian national calendar, has its epoch near the vernal equinox of year 78.
- The Saptarshi calendar traditionally has its epoch at 3076 BCE.

J.A.B. van Buitenen (2008) reports on the calendars in India:

The oldest system, in many respects the basis of the classical one, is known from texts of about 1000 BCE. It divides an approximate solar year of 360 days into 12 lunar months of 27 (according to the early Vedic text *Taittirīya Saṃhitā* 4.4.10.1–3) or 28 (according to the *Atharvaveda*, the fourth of the Vedas, 19.7.1.) days.

Indian and Greek astronomy

There are a number of Indian astronomical texts that are dated to the sixth century CE or later with a high degree of certainty. There is substantial similarity between these and pre-Ptolomaic Greek astronomy. It is believed that these similarities suggest a Greek origin for certain aspects of Indian astronomy. One of the direct proofs for this approach is the fact quoted that many Sanskrit words related to astronomy, astrology and calendar are either direct phonetical borrowings from the Greek language, or translations, assuming complex ideas, like the names of the days of the week which presuppose a relation between those days, planets (including Sun and Moon) and gods.

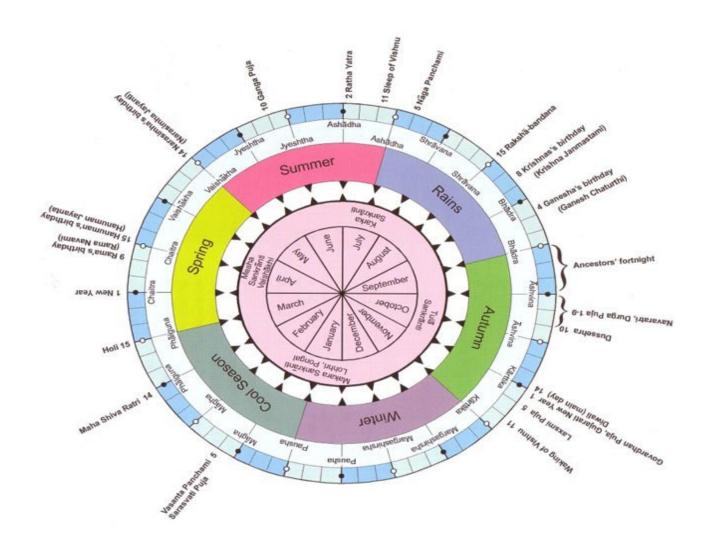
With the rise of Greek culture in the east, Hellenistic astronomy filtered eastwards to India, where it profoundly influenced the local astronomical tradition. For example, Hellenistic astronomy is known to have been practiced near India in the Greco-Bactrian city of Ai-Khanoum from the 3rd century BCE. Various sun-dials, including an equatorial sundial adjusted to the latitude of Ujjain have been found in archaeological excavations there. Numerous interactions with the Mauryan Empire, and the later expansion of the Indo-Greeks into India suggest that transmission of Greek astronomical

ideas to India occurred during this period. The Greek concept of a spherical earth surrounded by the spheres of planets, further influenced the astronomers like Varahamihira and Brahmagupta.

Several Greco-Roman astrological treatises are also known to have been exported to India during the first few centuries of our era. The *Yavanajataka* was a Sanskrit text of the 3rd century CE on Greek horoscopy and mathematical astronomy. Rudradaman's capital at Ujjain became the Greenwich of Indian astronomers and the Arin of the Arabic and Latin astronomical treatises; for it was he and his successors who encouraged the introduction of Greek horoscopy and astronomy into India."

Later in the 6th century, the *Romaka Siddhanta* ("Doctrine of the Romans"), and the *Paulisa Siddhanta* ("Doctrine of Paul") were considered as two of the five main astrological treatises, which were compiled by Varāhamihira in his *Pañca-siddhāntikā* ("Five Treatises"), a compendium of Greek, Egyptian, Roman and Indian astronomy. Varāhamihira goes on to state that "The Greeks, indeed, are foreigners, but with them this science (astronomy) is in a flourishing state." Another Indian text, the *Gargi-Samhita*, also similarly compliments the Yavanas (Greeks) noting that the Yavanas though barbarians must be respected as seers for their introduction of astronomy in

India . 5



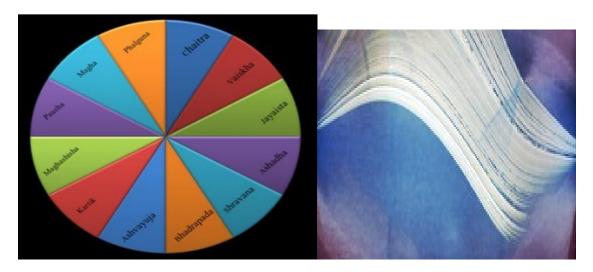
Detailed Indian Calendar

India is a land of 5000 year old civilization, with many different cultures, customs, spirituality, philosophy, people and languages. It is the land of celebrations. Fairs and festivals are the cultural heritage and spirit of Indian society to this day. India has seven major faiths. It has a large agricultural population and a rich historical background. All these Indian fairs and festivals represent people from diverse background, regions, communities and religions. The festivities are marked by folk dances, music played on a variety of local instruments, and traditional food. All festivals have their own spectacle, with important characteristics. There are religious festivals, cattle fairs and seasonal festivals celebrations throughout the year. Indian festivals encompass processions in the streets, decoration of homes and sacred places such as temples, folk song and dance performances. Most religious festivals have elaborate prayers, traditions, customs and rituals attached to them.

Indian festivals don't have fixed dates because they don't follow the Gregorian calendar.

The Indian Calendar system and the Gregorian calendar system The western calendar is known as Gregorian calendar. It is based on the sun, in which, one year is the time required for the earth to complete one round around the sun. Earth takes 365 days, 5 hours, 48minutes and 46seconds to complete a rotation around the sun. In our one year we have 365days, but these extra hours, minutes and seconds every year, create an extra day every four years. The year with an extra day is known as leap year.

The Hindu calendar was founded in the Vedic times, and it has gone through number of changes through the ages. It is known as Panchang, which is based on both the sun and the moon. This calendar covers everything from phases of the moon, the positions of stars and planets, and identifies auspicious times and days, for various activities. It uses a solar year but divides it into 12 lunar months. A lunar month is precisely 29 days, 12 hours, 44 minutes, and 3 seconds long. Twelve such months constitute a lunar year of 354 days, 8 hours, 48 minutes, and 36 seconds. To match the lunar months with the year, every two and a half year an extra months arises. In other words, every 30 months an extra month is added. This extra month is known as Adhik Mas. In the Indian calendar, seasons follow the sun, months follow the moon, and days follow both sun and moon. Lunar days in the Indian calendar are called Tithis. The Tithi system works from full moon night, to new moon night, to full moon night. Indian festivals follow the Tithis calander, this is why festivals in India don't follow the Gregorian calendar dates. The Indian government and businesses use the Gregorian calendar for administrative purposes.



The above image shows the months of the Lunar calendar. The first month of the year is Chaitra, which starts around the end of March or beginning of April, depending on the Tithi calculation. The following months continue through the rest of the year.

A **solstice** is an event that occurs when the Sun appears to reach its most northerly or southerly excursion relative to the celestial equator on the celestial sphere. Two solstices occur annually, around June 21 and December 21. In many countries, the seasons of the year are determined by reference to the solstices and the equinoxes.

The term *solstice* can also be used in a broader sense, as the day when this occurs. The day of a solstice in either hemisphere has either the most sunlight of the year (summer solstice) or the least sunlight of the year (winter solstice) for any place other than the Equator. Alternative terms, with no ambiguity as to which hemisphere is the context, are "June solstice" and "December solstice", referring to the months in which they take place every year.

The word *solstice* is derived from the Latin *sol* ("sun") and *sistere* ("to stand still"), because at the solstices, the Sun's declination appears to "stand still"; that is, the seasonal movement of the Sun's daily path (as seen from Earth) pauses at a northern or southern limit before reversing direction.

Astronomical almanacs define the solstices as the moments when the Sun passes through the solstitial colure, i.e. the times when the apparent geocentric longitude of the Sun is equal to 90° (summer solstice) or 270° (winter solstice). The dates of the solstice varies each year and may occur a day earlier or later depending on the time zone. The solstices always occur between June 20 and 22 and between December 20 and 23 with the 21st and 22nd being the most common dates.

Definitions: For an observer on the North Pole, the Sun reaches the highest position in the sky once a year in June. The day this occurs is called the June solstice day. Similarly, for an observer on the South Pole, the Sun reaches the highest position on the December solstice day. When it is the summer solstice at one Pole, it is the winter solstice on the other. The Sun's westerly motion never ceases as Earth is continually in rotation. However, the Sun's motion in declination comes to a stop at the moment of solstice. In that sense, solstice means "sun-standing".

This modern scientific word descends from a Latin scientific word in use in the late Roman Republic of the 1st century BC: *solstitium*. Pliny uses it a number of times in his *Natural History* with a similar meaning that it has today. It contains two Latin-language morphemes, *sol*, "sun", and *-stitium*, "stoppage". [4] The Romans used "standing" to refer to a component of the relative velocity of the Sun as it is observed in the sky. Relative velocity is the motion of an object from the point of view of an observer in a frame of

reference. From a fixed position on the ground, the Sun appears to orbit around Earth.

To an observer in an inertial frame of reference, planet Earth is seen to rotate about an axis and revolve around the Sun in an elliptical path with the Sun at one focus. Earth's axis is tilted with respect to the plane of Earth's orbit and this axis maintains a position that changes little with respect to the background of stars. An observer on Earth therefore sees a solar path that is the result of both rotation and revolution.

A solargraph taken from the Atacama Pathfinder Experiment at the Llano de Chajnantor Observatory in the southern hemisphere. This is a long-exposure photograph, with the image exposed for six months in a direction facing east of north, from mid-December 2009 until the southern winter solstice in June 2010. The Sun's path each day can be seen from right to left in this image across the sky; the path of the following day runs slightly lower, until the day of the winter solstice, whose path is the lowest one in the image.

The component of the Sun's motion seen by an earthbound observer caused by the revolution of the tilted axis – which, keeping the same angle in space, is oriented toward or away from the Sun – is an observed daily increment (and lateral offset) of the elevation of the Sun at noon for approximately six months and observed daily decrement for the remaining six months. At maximum or minimum elevation, the relative yearly motion of the Sun perpendicular to the horizon stops and reverses direction.

Outside of the tropics, the maximum elevation occurs at the summer solstice and the minimum at the winter solstice. The path of the Sun, or ecliptic, sweeps north and south between the northern and southern hemispheres. The days are longer around the summer solstice and shorter around the winter solstice. When the Sun's path crosses the equator, the length of the nights at latitudes $+L^{\circ}$ and $-L^{\circ}$ are of equal length. This is known as an equinox. There are two solstices and two equinoxes in a tropical year.

Relationship to Season

The seasons occur because the Earth's axis of rotation is not perpendicular to its orbital plane (the plane of the ecliptic) but currently makes an angle of about 23.44° (called the obliquity of the ecliptic), and because the axis keeps its orientation with respect to an inertial frame of reference. As a consequence, for half the year the Northern Hemisphere is inclined toward the Sun while for the other half year the Southern Hemisphere has this distinction. The two moments when the inclination of Earth's rotational axis has maximum effect are the solstices.

Cleomedes states:

The band of the Zodiac (zōdiakos kuklos, "zodiacal circle") is at an oblique angle (loksos) because it is positioned between the tropical circles and equinoctial circle touching each of the tropical circles at one point ... This Zodiac has a determinable width (set at 8° today) ... that is why it is described by three circles: the central one is called "heliacal" (hēliakos, "of the sun").

The term heliacal circle is used for the ecliptic, which is in the center of the zodiacal circle, conceived as a band including the noted constellations named on mythical themes. Other authors use Zodiac to mean ecliptic, which first appears in a gloss of unknown author in a passage of Cleomedes where he is explaining that the Moon is in the zodiacal circle as well and periodically crosses the path of the Sun. As some of these crossings represent eclipses of the Moon, the path of the Sun is given a synonym, the *ekleiptikos* (*kuklos*) from *ekleipsis*, "eclipse".

In the Hindu calendar, two sidereal solstices are named Makara Sankranti which marks the start of Uttarayana and Karka Sankranti which marks the start of Dakshinayana. The former occurs around January 14 each year, while the latter occurs around July 14 each year. These mark the movement of the Sun along a sidereally fixed zodiac (precession is ignored) into Makara, the zodiacal sign which corresponds with Capricorn, and into Karka, the zodiacal sign which corresponds with Cancer, respectively.

Solstice determination: Unlike the equinox, the solstice time is not easy to determine. The changes in solar declination become smaller as the Sun gets closer to its maximum/minimum declination. The days before and after the solstice, the declination speed is less than 30 arcseconds per day which is less than $\frac{1}{60}$ of the angular size of the Sun, or the equivalent to just 2 seconds of right ascension.

This difference is hardly detectable with indirect viewing based devices like sextant equipped with a vernier, and impossible with more traditional tools like a gnomon or an astrolabe. It is also hard to detect the changes in sunrise/sunset azimuth due to the atmospheric refraction changes. Those accuracy issues render it impossible to determine the solstice day based on observations made within the 3 (or even 5) days surrounding the solstice without the use of more complex tools.

Using the current official IAU constellation boundaries – and taking into account the variable precession speed and the rotation of the ecliptic – the solstices shift through the constellations as follows^[28] (expressed in astronomical year numbering in which the year 0 = 1 BC, -1 = 2 BC, etc.): The northern solstice passed from Leo into Cancer in year -1458, passed into Gemini in year -10, passed into Taurus in December 1989, and is expected to pass into Aries in year 4609.

The southern solstice passed from Capricornus into Sagittarius in year -130, is expected to pass into Ophiuchus in year 2269, and is expected to pass into Scorpius in year 3597.

Historic Background

The Angkor Empire was established around the end of the eighth century AD. Prior to this, the area was politically fragmented and often the target of attacks from surrounding forces. At the end of the century, however, Prince Jayavarman II united the land between Tonle Sap Lake and the hills of Mount Kulen and declared an independent state. The area was called Kambujadesa. or Cambodia. Following this unification,

Jayavarman II was proclaimed king in 802 AD. His coronation took place on Mount Kulen. Jayavarman II was succeeded by his son Jayavarman III in 850 AD, who in turn was succeeded by his cousin Indravarman I (r. 877-c. 890 AD). Among the temples that Indravarman I built were Preah Ko and Bakong, the latter being one of the earliest of the major Angkor pyramids built to symbolise Mount Meru. A long line of kings ruled Angkor, although succession was often contentious. The most significant in memory include Survavarman II (r. 1113-c. 1150 AD), the founder of Angkor Wat, and Jayavarman VII (r. 1181-c. 1220 AD). Jayavarman VII defeated invading Cham forces and undertook massive building campaigns. Among his most impressive feats was the construction of Angkor Thom, which included the Bayon temple at its centre. Importantly, Jayavarman VII changed the official state religion from Shaivism (a tradition within Hinduism) to Mahayana Buddhism. In the late thirteenth century AD, under the rule of Srindravarman (1295-1307 AD), the state religion was again changed, this time to Theravada Buddhism.

The history of religious change is important because it accounts for the mix of Brahmanical and Buddhist elements within the temples. The success of the Angkor Empire was due to a combination of factors. First was the ability to regulate water through a sophisticated network of barays and canals. The climate of Southeast Asia alternates between a wet (monsoon) season and a dry season. At Angkor, the man-made hydrological system mitigated wet season flooding by channeling water into the Tonle Sap Lake and, alternatively, allowed for its collection and use during the dry season (Fletcher et al. 2008, 662; Kummu 2009, 1419). Recent research also suggests that a high water table unique to the area contributed to high agricultural productivity (Acker 2012). As noted by Higham (2004, 16–17), Zhou Daguan, a Chinese diplomat who visited the area in 1296 AD, reported that three or four crops of rice were grown during the course of a year (Zhou 2007, 67 [Chapter 17, "Cultivating the Land"]).

Also contributing to the Angkor economy was an abundance of fish, which migrate with the seasonal backflow of the Mekong River into the Tonle Sap Lake. Kummu (2009, 1415) notes that "the Tonle Sap is believed to be among the most productive freshwater ecosystems in the world", while K. M. Srivastava (1987, 12) reports that "it is said that fishing the great lake used to yield about 100,000 tons of fish every year, providing a basic part of the Kampuchean diet".

Also fortuitous was the ready availability of iron ore. Significant deposits have been found in Preah Vihear province (at Phnom Dek), which is about 100 km east of Angkor Wat, as well as smelting furnaces dating to Angkorian times, and more than 230 iron-slag mounds (Hendrickson *et al.* 2013; Pryce *et al.* 2014; Vachon 2017). Iron tools and weapons provided Angkorians with significant advantages in trade, agriculture and warfare, and this, along with plentiful water and the infrastructure to control it, abundant rice and fish, and iron tools and weapons were the material drivers behind an empire that flourished for hundreds of years.

Many explanations have been proposed for the empire's eventual collapse,

including engineering flaws associated with the *baray*s and canals, geological uplift, deforestation, disease outbreak and state conversion to Theravada Buddhism (see Stone 2006 for a useful review). Perhaps most compelling, though, is recent evidence showing that during the mid-to late fourteenth century AD and into the fifteenth century AD, the Angkor area experienced weak monsoon rains and long periods of drought, punctuated by intense soil-eroding monsoons and serious flooding that damaged water management infrastructures (Buckley *et al.* 2010). The likely result was significant agricultural failures. The situation may also have been exacerbated by military incursions from the Ayutthaya kingdom to the north (Zhou 2007, 79 [Chapter 34, "Villages"]). Whatever the cause or multiple cascading causes, by c. 1430 AD the capital had been moved south and the empire shrank. At Angkor, temples and palaces were abandoned and left to the jungle.

In the early 1600s, the existence of Angkor was reported in the West by Portuguese traders. From that time, a slow but steady entourage of visitors made their way to the temples, setting the stage in 1907 for the Ecole francaise d'Extreme-Orient (French School of the Far East) to clear and restore the "lost" monuments.

Khmer Architecture

Angkor temples are unique – especially the stepped pyramids with quincunx towers at the top. Angkor architecture, however, draws upon early Indic (and similar Buddhist) cosmological concepts codified, for example, in the Hindu *Vastu shastra* architectural texts. Among the Angkor design elements that have their roots in Indic cosmology and architectural design are square or rectangular ground plans (Kollar 2001,

49–59), orientation to the cardinal directions (see especially Aller and Belmonte 2016), centre shrines dedicated to a specific god such as Vishnu or Shiva, spectacular towers, elaborate gateways called *gopuras* situated along major and minor axes and, in the twelfth century AD,

The fundamental idea is that the microcosmic temple should reflect the structure of the macrocosmic universe (Coedes 1963, 41). In Brahmanical cosmology

the universe expands outward from Mount Meru, which is at the centre (Flood 1996, 112; Stuart-Fox and Reeve 2011, 109). The divine city of Indra is at the summit of Mount Meru (Jessup 1997, 101), and the Earth is at its base. The Earth has four cardinal directions (Kramrisch 1976 [1946], vol. 1, 17). Each direction is presided over by a guardian god:

Soma or Kubera in the north; Yama in the south; Sūrya or Indra in the east; and Varuna in the west (Kollar 2001, fig. 5; Baumer *et al.* 2005, fig. 1). Connecting the cardinal directions results in a square (Kramrisch 1976 [1946], 17). The Earth is divided into multiple continents, surrounded by a series of oceans (Flood 1996, 112), and there are multiple levels vertically above and below the earth. The cosmos is populated by different kinds of beings, including humans, plants, animals, gods, *apsaras*, *naga*-serpents and demons(Flood 1996, 112).

This model of the Brahmanical cosmos is greatly over-simplified, but it issufficient for introducing Angkor Wat and other temples. The central pyramid at Angkor Wat is most often interpreted as a microcosmic representation of Mount Meru (for example, Laur 2002, 59; Coe 2003, 117), the towers surrounding the central tower representing the peaks of Mount Meru, or mountains that surround Mount Meru. The innermost square or rectangular area represents the Earth, perimeter walls represent mountain chains that encircle the Earth and surrounding moat(s) symbolise the cosmic seas. Concentric walls and moats express the outward expansion of the universe from the centre. Gateways at the ends of major and minor axes align Angkor Wat and other temples to the cardinal directions (although there are exceptions noted below).

As prescribed by *Vastu shastra* manuals, the ground plans of temples based on

Brahmanical cosmology are built so that they follow the ideal forms of yantras or mandalas – geometric diagrams that symbolise the cosmos just described. Most yantras and mandalas are square in shape, although, rectangular examples are also known. The ground plan of the tenth-century AD Varahi Deula of Chaurasi temple in Odisha, India, for example, is modelled after the rectangular Yoginī yantra (Khanna 1979, 145; Baumer et al. 2005). In either case, as explained by Khanna (1979, 143–

144), "the ritual diagram is an 'ideogram,' while the temple is a materialization of the concepts it embodies".

Following the structural model of the cosmos, most Angkor temples face the cardinal directions. However, that does not preclude additional and simultaneous solstice alignments.

People were well aware of the solstices at an early date, as documented in early

Vedic texts (discussed below). Solstice alignments are also reported for several Hindu temples that are temporally coincident with, or pre-date, Angkor (for example, *Vishnu Purāna* 6.8, in Wilson 2015 [1865], 254; also Shylaja 2015).

At Angkor, solstice alignments extend either from midpoints on eastern and western walls across to opposite corners of rectangular enclosures, or from architecturally significant points situated on the east-west axis across to the corners of quadrilateral enclosures. As shown by the data in Table 1, as well as in the imagery that follows, at Angkor the east-west (minor) axes of temples are a bit longer than their north-south (major) axes. The astronomically related reason for this can be explained by reference to Figures 4a-4d. Figure 4a shows a square with the solstice azimuths for the Angkor area plotted from points A and B. Notably, the solstice azimuths fail to intersect the corners by 2.0-3.0°. Figures 4b and 4c show, respectively, rectangles made by extending the north- south and east-west axes of a square. Here too, the solstice azimuths fail to intersect the corners. Figure 4d, however, shows a quadrilateral figure with proportions based on the solstice azimuths. In this case, the solstice azimuths intersect the corners of the rectangle. This is the proportional rectangle often found in Angkor temple complexes.

Figure 4e shows the difference between the square and the solstice rectangle.

For solstice azimuths to be incorporated into a temple design using the midpoint of the east and west walls as points of origin, it was necessary to morph or squash theideal square into a rectangle. By making the design plan for a temple slightly rectangularin shape, the solstice azimuths intersect the figure's corners while at the same time maintaining the symbolically meaningful quadripartite design. One of the implications of this design as a practical matter is that solstice alignments were probably not for observational purposes. In most cases, solstice sunrise or sunset events would not have been visible when standing at a solstice point of origin (in other words, points A and B in the figures that follow). Intervening structures block most views until the Sun is well above the horizon and at a different azimuth. (The exception of course would be observations made across

pyramidal levels before intervening towers were built.) Most solstice alignments therefore appear to have been for symbolic purposes.

In any case, the reason this rectangle works so well at Angkor is that, at this latitude, the solstice azimuths are nearly reciprocal. So, for example, the reciprocal difference In many cases, *gopuras*, or formal entranceways through enclosure walls, are positioned at the end of the north-south and east-west site axes (see for example, Figures S6a and S7a in the Supplementary Materials). *Gopuras* are common to Hindu and Angkor temple architecture, and they are often quite elaborate. However, they are more than just entranceways: as explained by Kollar (2001, 8), "gopurams mark the point physically for the passage from the profane to the sacred and mentally from preoccupations directed toward the material to those directed towards spiritual ends".

The special significance of *gopuras* at Angkor is suggested by the finding, for example, of a Buddhist shrine at the centre of the west gopura at Banteay Kdei (Figure 5). This location corresponds to point A in Figures 4d and 4e - the origin point (or bindu) for solstice (and equinox) sunrise azimuths. Gopuras situated at the ends of north-south axes delineate those directions. Gopuras therefore serve multiple purposes and have multiple layers of meaning: they are physical entrances into the structures, they demarcate sacred inner space, they orient structures and they are points of origins for certain celestial azimuths rom foundation stelae, it is known that Angkor temples were dedicated to one or more gods, such as Shiva or Vishnu. Typically, a linga, sacred relic, or sculpted image representing a Brahamanical god or manifestation of the Buddha is found at the base of the central tower, and often at other towers as well. The central tower is considered the heart of the temple, or bindu. From this centre point the energies of the manifested god radiate outward. In Brahmanical belief, the bindu (often represented by a dot) is considered the point from which creation began (Ranganathananda 1991, 21).





Angkor Wat, the front side of the main complex (Bjørn Christian Tørrissen/Wikimedia Commons)
Snapshot

The great Visnu temple at Angkor Wat in north-central Kampuchea (Cambodia) is known to have been built according to an astronomical plan. The astronomy of Angkor Wat has the lesson that the medieval and ancient Indian temple complexes should be examined for their astronomical bases.

This temple or temple complex containing several structures also the great Visnu temple of Angkor Wat was built by the Khmer Emperor Suryavarman II, who reigned during AD 1113-50. This temple was one of the many temples built from AD 879-1191, when the Khmer civilisation was at the height of its power. The Visnu temple has been called one of humankind's most impressive and enduring architectural achievements.

More than 20 years ago, *Science* carried a comprehensive analysis by Stencel, Gifford and Morón (SGM) of the astronomy and cosmology underlying the design of this temple. The authors concluded that it served as a practical observatory where the rising sun was aligned on the equinox and solstice days with the western entrance of the temple, and they identified 22 sighting lines for seasonally observing the risings of the sun and the moon.

Using a survey by Nafilyan and converting the figures to the Cambodian cubit or hat (0.435 m), SGM demonstrated that certain measurements of the temple record calendric and cosmological time cycles.

In addition, SGM showed that the west-east axis represents the periods of the yugas. The width of the moat is 439.78 hat; the distance from the first step of the western entrance gateway to balustrade wall at the end of causeway is 867.03 hat; the distance from the first step of the western entrance gateway to the first step of the central tower is 1,296.07 hat; and the distance from the first step of bridge to the geographic center of the temple is 1,734.41 hat. These correspond to the periods of 4,32,000, 864,000, 1,296,000, 1,728,000 years for the Kali, Dvapara, Treta, and Krta yuga, respectively. SGM suggest that the very slight discrepancy in the equations might be due to human error or erosion or sinking of the structure. In the central tower, the topmost elevation has external axial dimensions of 189.00 hat east-west, and 176.37 hat north-south, with the sum of 365.37. In the words of SGM, this is "perhaps the most outstanding number" in the complex, "almost the exact length of the solar year." But SGM were not able to explain the inequality of the two halves, which is the problem that we take up in this paper. We will show that these numbers are old Satapatha Brahmana numbers for the asymmetric motion of the sun.

The Historical Background of Angkor Wat

The kings of the Khmer empire ruled over a vast domain that reached from what is now southern Vietnam to Yunan, China and from Vietnam westward to the Bay of Bengal. The structures one sees at Angkor today, more than 100 temples in all, are the surviving religious remains of a grand social and administrative metropolis whose other buildings - palaces, public buildings, and houses - were all built of wood and are long since decayed and gone. As in most parts of India, where wood was plentiful, only the gods had the right to live in houses of stone or brick; the sovereigns and the common folk lived in pavilions and houses of wood.

Over the half-millenia of Khmer rule, the city of Angkor became a great pilgrimage destination because of the notion of Devaraja, which has been explained by Lokesh Chandra as a coronation icon. Jayavarman II (802-850) was the first to use this royal icon. According to Lokesh Chandra,

Devaraja means 'King of the Gods' and not 'God-King'. He is Indra and refers to the highly efficacious aindra mahabhiseka of the Rgvedic rajasuya tradition as elaborated in the Aitareyabrahmana. It was not a simple but a great coronation, a mahabhiseka. It was of extraordinary significance that Jayavarman II performed a Rgvedic rite, which lent him charismatic authority.

The increasingly larger temples built by the Khmer kings continued to function as the locus of the devotion to the Devaraja, and were at the same

time earthly and symbolic representations of mythical Mt Meru, the cosmological home of the Hindu gods and the axis of the world-system. The symbol of the king's divine authority was the sign (linga) of Siva within the temple's inner sanctuary, which represented both the axes of physical and the psychological worlds. The worship of Siva and Visnu separately, and together as Harihara, had been popular for considerable time in southeast Asia; Jayavarman's chief innovation was to use ancient Vedic mahabhiseka to define the symbol of government. To quote Lokesh Chandra further,

The icon used by Jayavarman II for his aindra mahabhiseka, his Devaraja = Indra (icon), became the symbol of the Cambodian state, as the sacred and secular sovereignty denoted by Prajapatisvara/Brahma, as the continuity of the vital flow of the universal (jagat) into the stability of the terrestrial kingdom (raja = rajya). As the founder of the new Kambuja state, he contributed a national palladium under its Cambodian appellation kamraten jagat ta raja/rajya. Whenever the capital was transferred by his successors, it was taken to the new nagara, for it had to be constantly in the capital.

Angkor Wat is the supreme masterpiece of Khmer art. The descriptions of the temple fall far short of communicating the great size, the perfect proportions and the astoundingly beautiful sculpture that everywhere presents itself to the viewer.

As an aside, it should be mentioned that some European scholars tended to date Angkor Wat as being after the fourteenth century. The principal reason was that some decorative motifs at Angkor Wat show a striking resemblance to certain motifs of the Italian Renaissance. This argument, which is similar to the one used in dating Indian mathematical texts vis-a-vis Greek texts, has been proven to be wrong. In the words of Cœdes, "If there is some connexion between the twelfth-century art of the Khmers, the direct heirs to the previous centuries, and the art of the Renaissance, it must have been due to a reverse process, that is to the importation of oriental objects into Europe."

Astronomy of Altars and Temples

To understand the astronomical aspects of Angkor Wat, it is necessary to begin with the Indian traditions of altar and temple design on which it is based. And since the Angkor Wat ritual hearkened to the Vedic past, it stands to reason that its astronomy was also connected to the Vedic astronomical tradition.

In a series of publications I have shown that the Vedic altars had an astronomical basis. In the basic scheme, the circle represented the earth and the square represented the heavens or the deity. But the altar or the temple, as a representation of the dynamism of the universe, required a breaking of

the symmetry of the square. As seen clearly in the agnicayana and other altar constructions, this was done in a variety of ways. Although the main altar might be square or its derivative, the overall sacred area was taken to be a departure from this shape. In particular, the temples to the goddess were drawn on a rectangular plan. In the introduction to the Silpa Prakasa, a ninth-twelfth century Orissan temple architecture text, Alice Boner writes, "[the Devi temples] represent the creative expanding forces, and therefore could not be logically be represented by a square, which is an eminently static form. While the immanent supreme principle is represented by the number ONE, the first stir of creation initiates duality, which is the number TWO, and is the producer of THREE and FOUR and all subsequent numbers upto the infinite." The dynamism is expressed by a doubling of the square to a rectangle or the ratio 1:2, where the garbhagrha is now built in the geometrical centre. For a three-dimensional structure, the basic symmetry-breaking ratio is 1:2:4, which can be continued further to another doubling.

The constructions of the Harappan period (2,600-1,900 BC) appear to be according to the same principles. The dynamic ratio of 1:2:4 is the most commonly encountered size of rooms of houses, in the overall plan of houses and the construction of large public buildings. This ratio is also reflected in the overall plan of the large walled sector at Mohenjo Daro called the citadel mound. It is even the most commonly encountered brick size.

There is evidence of temple structures in the Harappan period in addition to iconography that recalls the goddess. Structures dating to 2000 BC, built in the design of yantras, have been unearthed in northern Afghanistan. There is ample evidence for a continuity in the religious and artistic tradition of India from the Harappan times, if not earlier. These ideas and the astronomical basis continued in the architecture of the temples of the classical age. Kramrisch has argued that the number 25,920, the number of years in the precessional period of the earth, is also reflected in the plan of the temple.

According to the art-historian Alice Boner,

[T]he temple must, in its space-directions, be established in relation to the motion of the heavenly bodies. But in as much as it incorporates in a single synthesis the unequal courses of the sun, the moon and the planets, it also symbolises all recurrent time sequences: the day, the month, the year and the wider cycles marked by the recurrence of a complete cycle of eclipses, when the sun and the moon are readjusted in their original positions, anew cycle of creation begins.

It is clear then that the Hindu temple is a conception of the astronomical frame of the universe. In this conception, it serves the same purpose as the Vedic altar, which served to express the motions of the sun and the moon. The progressive complexity of the classical temple was inevitable given an

attempt to bring in the cycles of the planets and other ideas of the yugas into the scheme.

A text like the Silpa Prakasa would be expected to express the principles of temple construction of the times that led to the Angkor Wat temple. Given the prominence to the yuga periods in Angkor Wat and a variety of other evidence, it is clear that there is a continuity between the Vedic and Puranic astronomy and cosmology and the design of Angkor Wat.

Solar and lunar measurements

Some of the solar and lunar numbers that show up in the design of the Angkor Wat temple are the number of naksatras, the number of months in the year, the days in the lunar month, the days of the solar month, and so so. Lunar observations appear to have been made from the causeway. SGM list 22 alignments in their paper, these could have been used to track not just the solar and lunar motions but also planetary motions.

The division of the year into the two halves: 189 and 176.37 has puzzled SGM. But precisely the same division is described in the *Satapatha Brahmana*. In layer 5 of the altar described in the Satapatha, a division of the year into the two halves in the proportion 15:14 is given. This proportion corresponds to the numbers 189 and 176.4, which are just the numbers used at Angkor Wat.

Consider the physics behind the asymmetry in the sun's orbit. The period from the autumnal equinox to the vernal equinox is smaller than the opposite circuit. The interval between successive perihelia, the anomalistic year, is 365.25964 days, which is 0.01845 days longer than the tropical year on which our calendar is based. In 1,000 calendar years, the date of the perihelion advances about 18 days. The perihelion was roughly on 18 December during the time of the construction of Angkor Wat; and it was on 27 October during early second millennium BC, the most likely period of the composition of the *Satapatha Brahmana*. In all these cases, the perihelion occurs during the autumn/winter period, and so by Kepler's 2nd law we know that the speed of the sun in its orbit around the earth is greater during the months of autumn and winter than in spring and summer.

During the time of the Satapatha Brahmana, the apogee was about midway through the spring season, which was then somewhat more than 94 days. The extra brick in the spring quadrant may symbolically reflect the discovery that this quarter had more days in it, a discovery made at a time when a satisfactory formula had not yet been developed for the progress of the sun on the ecliptic.

It is possible that the period from the spring equinox to the fall equinox was taken to be about 189 days by doubling the period of the spring season; 176 days became the period of the reverse circuit.

Why not assume that there was no more to these numbers than a division into the proportions 15:14 derived from some numerological considerations? First, we have the evidence from the *Satapatha Brahmana* that expressly informs us that the count of days from the winter to the summer solstice was different, and shorter, than the count in the reverse order. Second, the altar design is explicitly about the sun's circuit around the earth and so the proportion of 15:14 must be converted into the appropriate count with respect to the length of the year. Furthermore, the many astronomical alignments of the Angkor Wat impress on us the fairly elaborate system of naked-eye observations that were the basis of the temple astronomy.

But since precisely the same numbers were used in Angkor Wat as were mentioned much earlier in the *Satapatha Brahmana*, one would presume that these numbers were used as a part of ancient sacred lore. We see the count between the solstices has been changing much faster than the count between the equinoxes because the perigee has been, in the past two thousand years, somewhere between the autumn and the winter months. Because of its relative constancy, the count between the equinoxes became one of the primary 'constants' of Vedic/Puranic astronomy.

The equinoctial half-years are currently about 186 and 179, respectively, and were not much different when Angkor Wat temple was constructed. Given that the length of the year was known to considerable precision, there is no reason to assume that these counts were not known. But it appears that a 'normative' division according to the ancient proportion was used.

As it was known that the solar year was about 365.25 days, the old proportion of 15:14 would give the distribution 188.92 and 176.33, and that is very much the Angkor Wat numbers of 189 and 176.37 within human error. In other words, the choice of these 'constants' may have been determined by the use of the ancient proportion of 15:14.

Conclusions

It has long been known that the Angkor Wat temple astronomy is derived from Puranic and Siddhantic ideas. Here we present evidence that takes us to the Vedic roots for the division of the solar year in Angkor Wat into two unequal halves. This division is across the equinoxes and that number has not changed very much during the passage of time from the Brahmanas to the construction of the Angkor Wat temple, so it is not surprising that it figures so prominently in the astronomy. It also appears that the count of 189 days may have been obtained by doubling the measured period for the spring season.

The astronomy of Angkor Wat has the lesson that the medieval and ancient Indian temple complexes, which were also built with basic astronomical observations in Hinduism.⁶

"Angkor Wat, as one of the world's largest ancient religious structures. Each year, thousands of visitors make the pilgrimage to Angkor Wat to witness the equinox sunrise over the temple's lotus-shaped towers. In addition to the equinox alignment, however, there are other alignments at Angkor Wat and many of the surrounding temples. In this article, multiple solstice alignments are identified for Angkor Wat and 11 nearby temples: Bakong, Phnom Bakheng, Phnom Bok, Phnom Krom, East Mebon, Pre Rup, Banteay Srei, Ta Keo, Baphuon, Preah Khan and Bayon. Subsequent to ground and aerial reconnaissance of the above sites, archaeoastronomical assessments were made using Google Earth Pro, with solstice azimuths calculated using standard protocols. More than 70 solstice alignments were thus identified. The multiplicity of solstice alignments, combined with other data, suggest that it was important for Angkor temples to be connected to the Sun. If, as endorsed here, Angkor temples were microcosmic models of the cosmos, then arguably, solstice alignments connected the temples to the cyclic movement of the cosmos as manifested by the solar cycle.

In a study carried out it was discovered that multiple solstice alignments embedded within the architecture of Angkor Wat and associated temples. Multiple lines of evidence suggest that these alignments are not fortuitous or epiphenomenal, but rather represent one way the Sun was memorialised and integrated into the fabric of Angkor temples. The incorporation of solstice alignments in the Angkor temples complements the findings of zenith passage alignments reported by Barnhart and

Powell (2013) and equinox alignments noted by Magli (2017) and others. ⁷

For more on the Solstice at Angkor areas Read the fascinating research presented by Prof. William F. Romain in *Solstice Alignments at Angkor Wat and Nearby Temples: William F. Romain See F.N. 7*



Few parting words about the Angkor Wat: - worlds biggest temple in Cambodia

Spreading across 402 acres (162.6ha) of area, stands Angkor Wat, the world's most astonishing and enduring architectural feats. The temple is a 900-year-old remain of Angkor Wat. One of the world's true enigmas, its size, and purpose baffling. Larger than any cathedral, it is truly one of the greatest structures ever built. Its towers shaped like lotus flowers raised a hundred years before the cathedral of Charters in France. The buildings were laid out on a vast scale, stone shrines ascending one upon the other as if reaching for the heavens.

The temple originally dedicated to the Lord Vishnu and constructed as a Hindu temple. But later by the end of the 12th century, transformed into Buddhist temple. The temple signifies the high classical style of Khmer architecture. Thus, became a symbol of the Cambodia National Flag.

It is still a mystery and a question amongst the archaeologists, who was the actual builder of this massive complex. Some say it was built by the Khmer King Suryavarman I in the early 12th century in the capital of the Khmer Empire, as his state capital and eventual mausoleum. But according to a myth, the construction of Angkor Wat was ordered by Lord Indra, to his son

Precha Ket Mealea. They say that the entire complex got constructed in a single night by the divine architect. Further, being said that the complex, is the exact replication of the Indra Lok (main palace of the Lord Indra). Subsequently, the temple somewhere has direct connections with the Hindu roots. Khmer had practiced Hindu style architecture for a greater period of time.

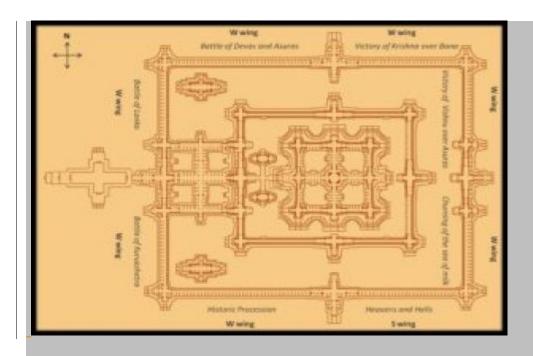


ONCEPT OF ANGKOR WAT:

The planning concept highly based on Vaastu Shastra, a traditional Indian system of architecture. Its four directions, dedicating themselves to the Hindu gods, with carvings depicting the faces of god-like Brahma and Sheshnaag. The main temple has five towers, each placed on respective north, south, east and west directions, and a quincunx of towers within the center.







DESIGNING AND PLANNING:

Angkor Wat combines two basic plans of Khmer temple architecture- the temple mountain and the later galleried temple. Its design represents Mount Meru, home of the devas of the Hindu mythology. The complex has more than a 5 km long moat. The outer wall, 3.6 km long with three rectangular galleries each raised above next.

The temple is an east-west orientation with the line of sight from terraces within the temple that show specific towers to be at the precise location of sunrise. Unlike most Khmer temples, Angkor Wat orients to the west rather than the east, which intends to serve as the funerary temple of Suryavarman. This explains that the Angkor Wat designed to dedicate the Lord Vishnu, who associates with the west direction.



STRUCTURE AND MATERIAL:

The walls of the vast monuments covered in intricate carvings. These reliefs illustrate legends of an ancient culture and its religion. The sandstone sections carved in place. Inscriptions in Angkor Wat are not only in an ancient Cambodian language but also in Sanskrit (the priestly language of the Hindus). The structure built using sandstone blocks, with laterite used for the outer walls and for hidden structural parts. The binding agent used to join the blocks are natural resins or slacked lime, yet not confirmed.

ARCHITECTURAL ELEMENTS:

The characteristic style includes the ogival, redented towers that shape like lotus buds. Half galleries with intricate carvings to broaden passageways. Axial galleries which connect to the enclosures and cruciform terraces which appear along the main axis of the temple. As the temple faces west, the features are all set back towards the east. Moreover, the west-facing steps are shallower than those on the other sides.

Its endless corridors, carved with the longest reliefs in the world. The precise construction could be hard to match even with lasers used by modern surveyors. The roofing of the gallery decorated with the motif of the body of the snake ending in the heads of lions or garudas. Carved lintels and pediments decorate the entrances to the galleries and to the shrines.



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3 https://www.visit-angkor.org/blog/sunrise-angkor-wat-heliotrope-in-cambodia/

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a. Kak, S. (2000). *The astronomical code of the Rgveda*. New . Delhi: Munshiram Manoharlal Publishers.

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e.Kak, Subhash C. "Archaeoastronomy and literature." *Current Science* 73.7 (1997): 624-627.

6. https://swarajyamag.com/culture/how-the-sublime-vishnu-temple-at-angkor-wat-is-an-expression-of-vedic-astronomy mind, should be examined for their astronomical bases.

The Solar Numbers in Angkor Wat Subhash Kak Department of Electrical & Computer Engineering Louisiana State University Baton Rouge, LA 70803-5901, USA FAX: 225.388.5200; Email: kak@ee.lsu.edu February 2, 2008 Abstract https://arxiv.org/pdf/physics/9811040v2.pdf

7. Solstice Alignments at Angkor Wat and Nearby Temples-Connecting to the Cycles of Time, William F. RomainIndependent scholar How The Sublime Vishnu Temple At Angkor Wat Is An Expression Of Vedic Astronomy by Subhash Kak-2016

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CHAPTER VI

COMPARISON Between the Vishnu Temple at Angkor Wat Cambodia and Shiva Temple at Elephanta Caves India

Comparative research studies should be used when comparing two temple designs, often cross-nationally. These studies analyze the similarities and differences between these two groups in an attempt to better understand both groups. Comparisons lead to new insights and better understanding of all participants involved. In her paper" A Comparative Analysis of the Temples of Khajuraho and the Ruling Chandellas of India, "Chelsea Gill in her Senior Thesis submitted in partial fulfillment of the requirements for the degree of Bachelor of Arts in Archaeological Studies University of Wisconsin-La Crosse points out that:

"For generations archaeologists have debated the reasons for the rise of complex societies and what material remains are associated with development of complex society. Throughout history around the world there have been many power shifts and changing political systems that have affected urban development. Empires have been an important part of this research because they represent one of the most complex societies. Empires are "states that expand rapidly, often through military conquest: they maintain standing armies. Empires are very large in terms of territory and

population, and they maintain sovereignty over all people and lands in their realm; they are diverse ecologically and ethnically and are organized to handle this diversity" (Smith and Schreiber 2006:3). One significant aspect of empires that archaeologists can study is monumental architecture. Monumental architecture includes large homesteads, palaces, public buildings, and special purpose buildings, such as the focus of this paper: temples (Trigger 1990:119). Temples are buildings that suggest that there was some powerful individual or state that had the time, skill, and resources to build a monument above what the practical utility of the building required (Trigger 1990:119-122). A temple's architectural extravagance can reveal the level of political and economic power ruling groups or upper class had. Ruling groups or individuals will produce extravagant temples in order to physically express their abilities and superiority over other groups. The temples extravagance reflects the available resources of the people responsible for building the temples."

In that spirit this article is written to understand both temples from a new perspective.

Location:

Angkor Wat, temple complex at Angkor, near Siĕmréab, Cambodia, that was built in the 12th century by King Suryavarman II (reigned 1113–c. 1150). The vast religious complex of Angkor Wat comprises more than a thousand buildings, and it is one of the great cultural wonders of the world. It is an architectural masterpiece and the largest religious monument in the world – covering an area four times the size of Vatican City. It is almost 900 years old. It is a Temple dedicated to Lord Vishnu and was later converted to Therdava Buddhist Temple by the then Ruler who changed his religion from Hinduism to Buddhism. Elephanta Caves however remained as hindu caves.

Elephanta: The small island of Elephanta on which the Shiva temple is located provides evidence of occupation by humans from as early as 2nd century B.C The **cave** temple, dedicated to Lord Shiva, was excavated sometime in the 8th century by the Rashtrakuta kings, who ruled the area between A.D. 757-973. The caves are located in the Arabian Sea and hence are highly impacted by saline activity as well as natural climatic changes. High water seepage in the caves due to heavy rainfall during the monsoon season has also been causing intense damage. Rock erosion is also corroding the sculptures, creating a need for strong technical safeguarding. Another threat comes in the form of industrial development in the area which is hazardous to the longevity of the caves. Some of the pillars inside the caves are in bad shape and need urgent restoration. Cracks have developed in certain areas which require immediate repair. Hence the caves call for a planned

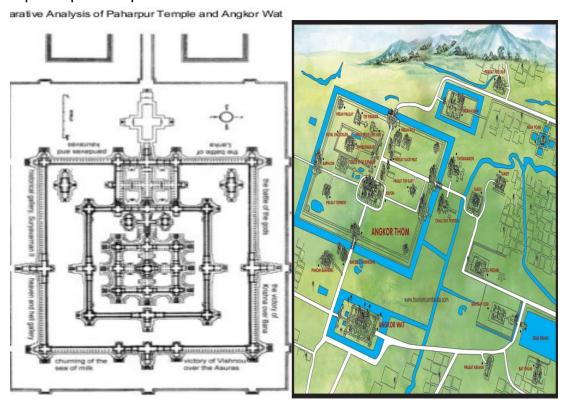
management of conservation and preservation along scientific lines.

Angkor and Shiva Elephanta Temple are both Hindu temples Angkor was later converted to Buddhist Temple by addition of a few statutes but basically remaining as a Hindu temple *in toto*. In the 12th century, King Suryavarman II of the Khmer Empire began work on a 500-acre (200 hectare) temple in the capital city of Angkor, in what is now Cambodia. The complex was built to honor the Hindu god Vishnu, but 14th-century leaders converted the site into a Buddhist temple.

Although the plan, form and symbols differ, Angkor Vat is cathedral-like in its harmonious mix of small details and massive architecture. Plan consists concentric rectangles. Orderly and balanced. Logically symmetrical.

Principal approach is from the west. Why the main gateway, flanked by libraries at right, faces west is unclear. The other temples face east, away from the direction of the dead. Partly to bring it into alignment with the royal city.

Façade consists of elaborate storied structure breaking the long lines of arcaded enclosure. Gateway interiors of the portico resolves itself into a square plan of pillared halls with two diametrical corridors.



Angkor

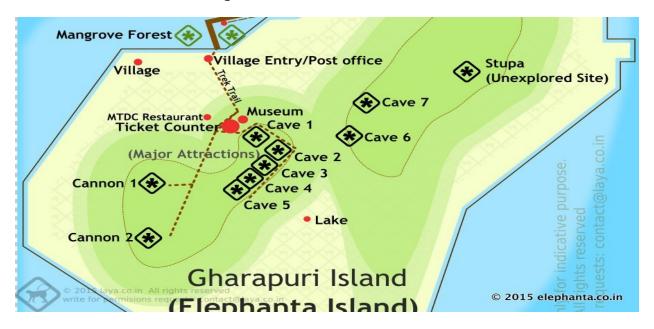
Entire scheme was laid out in 650 ft water moat. Broad square in plan. Total length of 24 miles. Communication across the water barrier was by a bridge on western side and approached by a pave of 36/1500 ft. Stone platform on which it stands is square in plan. Water Moat Stairway continuing the axial line of the portico ascends to the second terrace. At each angle of the terrace, the inner space of which is a square of 130 ft side is a Sikhara.

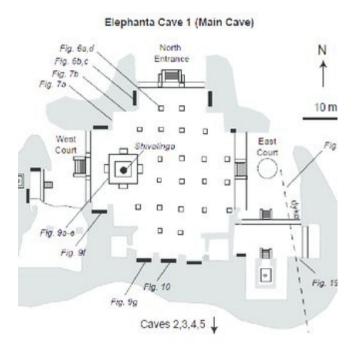
The name Angkor is a corruption of the Sanskrit "Nagara", meaning city or capital while "Vat" is a relatively modern Siamese name, so the name means "City Temple." Angkor Wat The temple was dedicated to the Hindu God Vishnu, by the fall of the empire in 15th century, the site had become a Buddhist shrine. Angkor Wat is partly protected from its most lethal destroyer, water, by a network of hidden drains emplaced in the 1960's by the French scholar and former conservator Bernard Philippe Groslier and his staff of 1000.

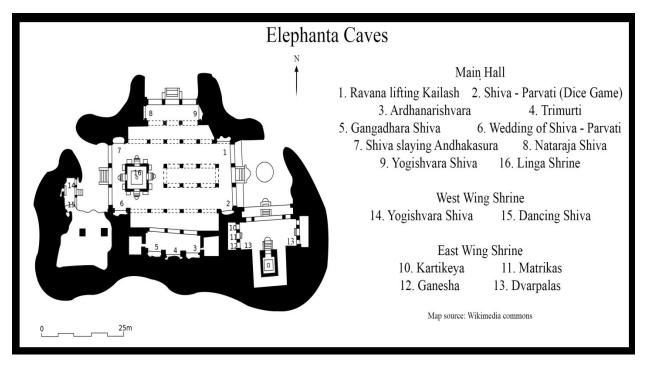
Angkor Wat (Plan above left) is considered to be the largest and most impressive stone temple in existence. This magnificent architectural composition was the conception of King Suryavarman II. Howvever it completed during the reign of King Dharanindravarman II.

The epic symmetries of Angkor Vat begin with the outer gallery that runs in a circumference of half a mile. Within the gallery sculptures in bas-relief unfold narratives from the myths of Vishnu, Krishna and Rama. One section of gallery top left that sheltered the depiction of a Hindu creation myth was removed for restoration. The stones were catalogued and neatly laid out in the grassy area beyond.

Shiva temple at Elephanta is Rock-cut architecture which is the structures, buildings, of and sculptures bγ solid rock where it naturally occurs. Rock-cut architecture is designed and made by man from the start to finish. In India and China, the terms cave and cavern are often applied to this form of man-made architecture. However, caves and caverns that began in natural form are not considered to be rock-cut architecture even if extensively modified. Although rock-cut structures differ from traditionally built structures in many ways, many rock-cut structures are made to replicate the facade or interior of traditional architectural forms. Interiors were usually carved out by starting at the roof of the planned space and then working downward. This technique prevents stones falling on workers below. The three main uses of rock-cut architecture were temples (like those in India), Rock-cut architecture, though intensely laborious with ancient tools and methods, was presumably combined with guarrying the rock for use elsewhere; the huge amounts of stone removed have normally vanished from the site. It is also said to be cut, hewn, etc., "from the living rock". Another term sometimes associated.







Indian rock-cut architecture is more various and found in greater abundance in that country than any other form of rock-cut architecture around the world. Rock-cut architecture is the practice of creating a structure by carving it out of solid natural rock. Rock that is not part of the structure is removed until the only rock left makes up the architectural elements of the excavated interior. Indian rock-cut architecture is mostly religious in nature.

There are more than 1,500 known rock-cut structures in India. Many of these structures contain artwork of global importance, and most are adorned with exquisite stone carvings. These ancient and medieval structures represent significant achievements of structural engineering and craftsmanship. [4] The effort expended often astonishes visitors, but seen from one aspect, a rock-cut structure is a decorated rock quarry; most of the stone removed was typically put to economic use elsewhere.

In India, caves have long been regarded as sacred places. Caves that were enlarged or entirely man-made were believed to be as sacred as natural caves. The sanctuary in all Indian religious structures, even free-standing ones, was designed to have the same cave-like feeling, as it is generally small and dark, without natural light. The oldest rock-cut architecture is found in the Barabar caves, Bihar, which were built around the 3rd century BC. Other early cave temples are found in the western Deccan; these are mostly Buddhist shrines and monasteries, dating between 100 BC and 170 AD. Originally, there were probably wooden structures associated with them, which would have deteriorated over time.

Historically, artisans carried forward design elements from wood in their rock-cut temples: skilled craftsmen carved rock to imitate timber texture, grain, and structure. The earliest cave temples include the Bhaja Caves, the Karla Caves, the Bedse Caves, the Kanheri Caves, and some of the Ajanta Caves. Relics found in these caves suggest a connection between the religious and the commercial. Buddhist missionaries are known to have accompanied traders on the busy international trading routes through India. Some of the more sumptuous cave temples, commissioned by wealthy traders, included pillars, arches, and elaborate facades. They were made during the period when maritime trade boomed between the Roman Empire and south-east Asia.

Although free-standing structural temples were being built by the 5th century, rock-cut cave temples continued to be built in parallel. Later rock-cut cave architecture became more sophisticated, as in the Ellora Caves. The monolithic Kailash Temple is considered to be the peak of this type construction. Although cave temples continued to be built until the 12th century, rock-cut architecture became almost totally structural in nature. That is, rocks were cut into bricks and used to build free-standing structures. Kailash was the last spectacular rock-cut excavated temple. Numerous rock reliefs, relief sculptures carved into rock faces, have been found outside caves or at other sites. New discoveries of relatively small rock-cut sites, mostly Buddhist, continue to be made in the 21st century, especially in the Deccan.

The earliest caves used by humans were natural caves that they occupied or used for a variety of purposes, such as shrines and shelters. Evidence suggests that the caves were first occupied and slightly altered during the Palaeolithic and Mesolithic periods, up to about 6000 BC. These changes

are not classified as architecture. Early examples included decorating overhanging rock with rock-cut designs. The Rock Shelters of Bhimbetka, now designated as a UNESCO World Heritage Site, are located on the edge of the Deccan Plateau, where dramatic erosion has left massive sandstone outcrops. Researchers have found primitive tools and decorative rock paintings made by humans in the area's many caves and grottos, the earliest paintings dating to circa 8,000 BCE.

During the time of the Buddha (c. 563/480 or c. 483/400 BCE), Buddhist monks were also in the habit of using natural caves, such as the Saptaparni Cave, southwest from Rajgir, Bihar. Many believe it to be the site in which Buddha spent some time before his death, and where the first Buddhist council was held after the Buddha died (paranirvana). The Buddha himself had also used the Indrasala Cave for meditation, starting a tradition of using caves, natural or man-made, as religious retreats, that would last for over a millennium.

After the Barabar Caves, huge efforts were made at building religious caves in Western India until the 6th century CE. However, the polishing of cave walls was abandoned, never to be revived. Such grandiose caves as Karla Caves (1st century CE) or the Ajanta Caves (5th century CE) do not have any polishing either. This may be due to the fact that Mauryan caves were dedicated and sponsored by the Mauryan Imperial government, allowing for huge resources and efforts to be spent, whereas later caves where essentially the result of donations by commoners, who could not afford as high a level of spending.

First wave of construction (2nd century BCE-4th century CE)



The Great Chaitya in the Karla Caves, Maharashtra, India, 1st-century CE.

Probably owing to the 2nd century BCE fall of the Mauryan Empire and the subsequent persecutions of Buddhism under Pushyamitra Sunga, it is thought that many Buddhists relocated to the Deccan under the protection of the Andhra dynasty, thus shifting the cave-building effort to western India: an enormous effort at creating religious caves (usually Buddhist or Jain) continued there until the 2nd century CE, culminating with the Karla Caves or the Pandavleni Caves. These caves generally followed an apsidal plan with a stupa in the back for the chaityas, and a rectangular plan with surrounding cells for the viharas.

When Buddhist missionaries arrived, they naturally gravitated to caves for use as temples and abodes, in accord with their religious ideas of asceticism and the monastic life. The Western Ghats topography, with its flat-topped basalt hills, deep ravines, and sharp cliffs, was suited to their cultural inclinations. The earliest of the Kanheri Caves were excavated in the 1st and 2nd centuries B.C., as were those at Ajanta, which were occupied continuously by Buddhist monks from 200 BCE to 650 AD. As the Buddhist ideology encouraged involvement in trade, monasteries often became stopovers for inland traders and provided lodging houses along trade routes. As mercantile and royal endowments grew, cave interiors became more elaborate, with interior walls decorated in paintings, reliefs, and intricate carvings. Numerous donors provided the funds for the building of these caves and left donatory inscriptions, including laity, members of the clergy. government officials, and even foreigners such as *Yavanas* (Greeks) representing about 8% of all inscriptions. Facades were added to the exteriors while the interiors became designated for specific uses, such as monasteries (viharas) and worship halls (chaityas). Over the centuries, simple caves began to resemble free-standing buildings, needing to be formally designed and requiring highly skilled artisans and craftsmen to complete. These artisans had not forgotten their timber roots and imitated the nuances of a wooden structure and the wood grain in working with stone.

Early of rock-cut architecture the **Buddhist** examples are and Jain cave basadi, temples and monasteries. many with gavakshas (chandrashalas). The ascetic nature of these religions inclined their followers to live in natural caves and grottos in the hillsides, away from the cities, and these became enhanced and embellished over time. Although many temples, monasteries, and stupas had been destroyed, by contrast, cave temples are very well preserved as they are both less visible and therefore less vulnerable to vandalism as well as made of more durable material than wood and masonry. There are around 1200 cave temples still in existence, most of which are Buddhist. The residences of monks were called Viharas and the cave shrines, called Chaityas, were for congregational worship.[31] The earliest rock-cut garbhagriha, similar to freestanding ones later, had an inner circular chamber with pillars to create a circumambulatory path (pradakshina) around the stupa and an outer rectangular hall for the congregation of the devotees.



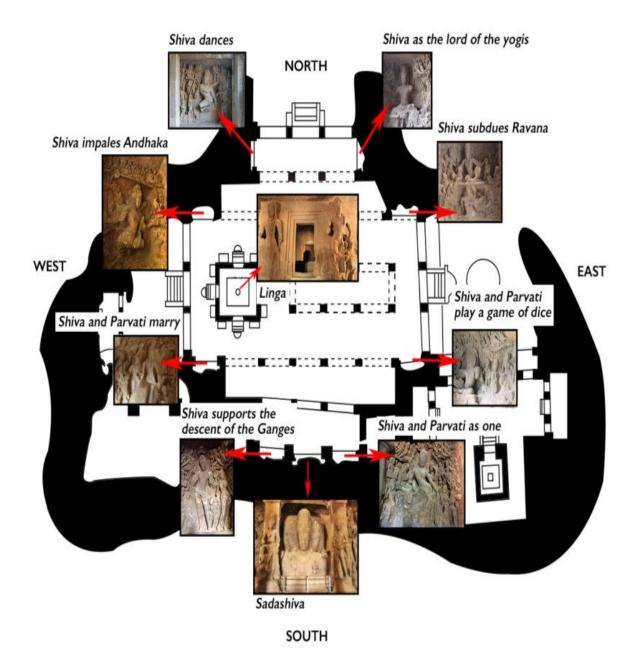
Manmodi Caves in Junnar, 2nd century CE.



Udayagiri and Khandagiri Caves, 2nd century BCE.

Materials:

Both are made of rocks. Angkor with Rock "Bricks" whereas Elephanta are carved out of volcanic granite found on the hills of the island of elephant.



Restoration: Angkor Wat

Angkor Wat Restoration efforts since the Angkor Wat temple "discovery" in 1860 have been numerous. In 1866, following the publication of Henri Mouhot's memoirs in Europe, a French expedition set up to search new trading routes with China along the Mekong would become the first step to a conscientious research of Angkor Wat. The expedition members surveyed the ruins, and their observations are recognised today as pioneering in French research at Angkor. In 1898 EFEO (Ecole Francaise D'extreme Orient) was established in Cambodia and started working toward clearing the monuments from the jungle and consolidation and restoration of the monuments. In 1908, the EFEO assisted with setting up Angkor Conservation in Siem Reap, the archaeological directorate of the Cambodian Government.

Interruption

The restoration of Angkor Wat came to a halt in the 1970s and 1980s following the civil war in Cambodia and the Khmer Rouge regime. However, despite the war, very little damage was done to the temple, as in the Khmer psyque Angkor Wat history is sacred and cherished. Overall, the Angkor temples were abandoned to the jungle for almost twenty years. Only the archaeological Survey of India managed to do work on the temples during 1860 and 1866, but their conservational efforts have been greatly criticized due to the use of their methods and materials. In the early 15th century Angkor was abandoned. Still Theravada Buddhist monks maintained Angkor Wat, which remained an important pilgrimage site and continued to attract European visitors. Angkor Wat was "rediscovered" after the French colonial regime was established in 1863.

In the 20th century various restoration programs were undertaken, but they were suspended amid the political unrest that engulfed Cambodia in the 1970s. When work resumed in the mid-1980s, the required repairs were extensive. Notably, sections had to be dismantled and rebuilt. In 1992 the Angkor complex, which included Angkor Wat, was designated a World Heritage site by UNESCO and was immediately added to the list of World Heritage in Danger. In the ensuing years, restoration efforts increased, and Angkor was removed from the danger list in 2004. Today Angkor Wat is one of the most important pilgrimage shrines in Southeast Asia and a popular tourist attraction. The temple complex appears on the Cambodian flag.



Angkor Wat temple, Siem Reap

Angkor Wat into the future

Since the 1990s Angkor Wat has experienced consistent conservation efforts and has become the main tourist attraction for Siem Reap, and Cambodia in general. This is mainly due to the fact that Angkor was named a World Heritage Site by Unesco in 1992. The funds and technical expertise provided by UNESCO have consolidated the restoration plan of the temple. The APSARA authority ("The Authority for the Protection of the Site and the Development of the region of Angkor) manages the conservation and protection of Angkor.

Since 1995 a team from Cologne University of Applied Sciences has been working to prevent further decay. The restoration and conservation measures are being carried out by lecturers and students from the Institute of Restoration and Conservation Science in cooperation with a team of Cambodian conservators. The project also receives support from external scientists in the fields of geology, geomicrobiology and chemistry.

Every natural stone has its own characteristic properties; each one reacts differently to the effects of the weather. Since 1995, therefore, the sandstone blocks used to build Angkor and the damage already caused have been the subject of detailed investigation so that decisions can be taken on the most suitable conservation methods. Every situation, every temple, is considered individually, and all steps in the process must be documented in detail.

A thorough survey revealed that about 300 apsaras and a large number of reliefs on the pediments of Angkor Wat were so badly damaged that large pieces of stone could fall off at any time. Since 1998 the weather-beaten reliefs have been undergoing painstaking conservation. However, it will not be possible to prevent further damage





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The Great Chaitya in the Karla Caves, Maharashtra, India, 1st-century CE.

Photograph of the Trimurti of Shiva in the cave temple of Elephanta (ABOVE PIC TO RIGHT) in Maharashtra from the 'Lee-Warner Collection: 'Bombay Presidency. William Lee Warner C.S.' taken by an unknown phototgrapher in the 1870s. The temple on the small island of Elephanta, off the coast of Bombay, is celebrated as one of the greatest achievements in rock-cut architecture in India. The temple is dedicated to Shiva, dates to the sixth century and consists of a series of chambers cut from the rock. There are five caves in total, but only the great cave can still be visited. The temple stands at 250 feet above sea level and measures 130 feet square, 17 feet high. At the centre of the cave is a hypostyle hall of 20 pillars in which stands the linga shrine, flanked by two excavated courts to the east and west of the shrine. The north entrance of the temple leads to the Trimurti of Shiva. The central face is calm and detached, the left profile expresses the feminine and

the peaceful and the right profile reveals the fierce and masculine. The three faces symbolise the nature of the Divine, which combines and trascends all opposites.

Vishnu

All of the original religious motifs derived from Hinduism, and the temple was dedicated to the gods Shiva, Brahma, and Vishnu. The five central towers of Angkor Wat symbolize the peaks of Mount Meru, which according to Hindu mythology is the dwelling place of the gods.

Who appears in the reliefs at Angkor Wat?:- Mandara represented by Vishnu (in the center). Several things happen while the churning of milk takes place. One event is that the foam from the churning produces apsaras or celestial maidens who are carved in relief throughout Angkor Wat (we see them here on either side of Vishnu, above the gods and demons).

Cambodia was first influenced by Hinduism during the beginning of the Kingdom of Funan. Hinduism was one of the Khmer Empire's official religions. Angkor Wat, the largest temple complex in the world (now Buddhist) was once a Hindu temple. ... Vishnu and Shiva were the most revered deities worshipped in Khmer Hindu temples. While most temples in this region face east, Angkor Wat faces West. This is to do with the temple's original link to Hinduism. Hindu deities are believed to sit facing east, while Vishnu, as supreme deity **faces** left. With Angkor Wat being dedicated to Vishnu, its temples do the same.

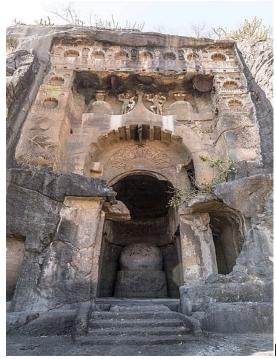
The main entrance faces north, while two side entrances face east and west. The cave's main entrance is aligned with the north-south axis, unusual for a Shiva shrine (normally east-west). However, inside is an integrated square plan Linga shrine (garbha-griya) that is aligned east-west, opening to the sunrise.

Probably owing to the 2nd century BCE fall of the Mauryan Empire and the subsequent persecutions of Buddhism under Pushyamitra Sunga, it is thought that many Buddhists relocated to the Deccan under the protection of the Andhra dynasty, thus shifting the cave-building effort to western India: an enormous effort at creating religious caves (usually Buddhist or Jain) continued there until the 2nd century CE, culminating with the Karla Caves or the Pandavleni Caves.^[20] These caves generally followed an apsidal plan with

a stupa in the back for the chaityas, and a rectangular plan with surrounding cells for the viharas.

When Buddhist missionaries arrived, they naturally gravitated to caves for use as temples and abodes, in accord with their religious ideas of asceticism and the monastic life. The Western Ghats topography, with its flat-topped basalt hills, deep ravines, and sharp cliffs, was suited to their cultural inclinations. The earliest of the Kanheri Caves were excavated in the 1st and 2nd centuries B.C., as were those at Ajanta, which were occupied continuously by Buddhist monks from 200 BCE to 650 AD. As the Buddhist ideology encouraged involvement in trade, monasteries often became stopovers for inland traders and provided lodging houses along trade routes. As mercantile and royal endowments grew, cave interiors became more elaborate, with interior walls decorated in paintings, reliefs, and intricate carvings. Numerous donors provided the funds for the building of these caves and left donatory inscriptions, including laity, members of the clergy, government officials, and even foreigners such as *Yavanas* (Greeks) representing about 8% of all inscriptions. Facades were added to the exteriors while the interiors became designated for specific uses, such as monasteries (viharas) and worship halls (chaityas). Over the centuries, simple caves began to resemble free-standing buildings, needing to be formally designed and requiring highly skilled artisans and craftsmen to complete. These artisans had not forgotten their timber roots and imitated the nuances of a wooden structure and the wood grain in working with stone.

Early examples of rock-cut architecture are the Buddhist and Jain cave basadi, temples and monasteries. many with gavakshas (chandrashalas). The ascetic nature of these religions inclined their followers to live in natural caves and grottos in the hillsides, away from the cities, and these became enhanced and embellished over time. Although many temples, monasteries, and stupas had been destroyed, by contrast, cave temples are very well preserved as they are both less visible and therefore less vulnerable to vandalism as well as made of more durable material than wood and masonry. There are around 1200 cave temples still in existence, most of which are Buddhist. The residences of monks were called Viharas and the cave shrines, called Chaityas, were for congregational worship.[31] The earliest rock-cut garbhagriha, similar to freestanding ones later, had an inner circular chamber with pillars to create a circumambulatory path (pradakshina) around the stupa and an outer rectangular hall for the congregation of the devotees.



Manmodi Caves in Junnar, 2nd century CE.



Udayagiri and Khandagiri Caves, 2nd century BCE.

Materials:

Both are made of rocks. Angkor with Rock "Bricks" whereas Elephanta are carved out of volcanic granite found on the hills of the island of elephant.

Elephanta The earliest attempts to prevent further damage to the caves were started by British India officials in 1909. The monuments were restored in the 1970s. In 1987, the restored Elephanta Caves were designated a UNESCO World Heritage Site. It is currently maintained by the Archaeological Survey of India (AS

Elephanta island has multiple Hindu caves and Buddhist monuments, as well as excavated caves that were left incomplete. This essay focuses on one particularly remarkable rock-cut cave that is an early example of an unconventional and innovative religious program in stone. The cave temple is dated to the sixth century and is dedicated to the Hindu god **Shiva**.

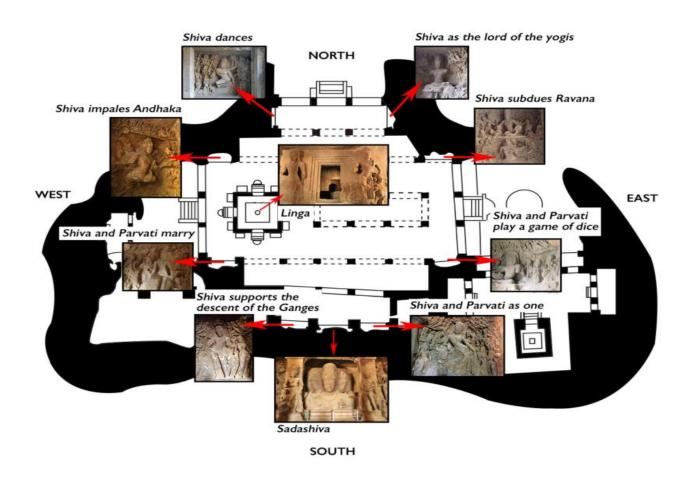
In Hinduism, god transcends form. But an emphasis on an underlying omnipotent and universal spirit (**Brahman**) allows for the existence of a large pantheon of deities. Each deity can, in turn, have many embodiments and a range of iconographic representations are employed in Hindu sacred art to tangibly portray the gods.

The cave of Shiva at Elephanta has at least ten distinct representations of Shiva; two of these – Shiva as *Ardhanarishvara*, in which Shiva and the goddess Parvati are joined as one, and Shiva as *Gangadhara*, in which Shiva is shown bearing the force of the river goddess Ganga's descent to earth, are referenced below. Shiva's manifestation as *Sadashiva* wherein the manifold aspects of Shiva are depicted on multiple faces is also discussed, as is the cave's Shiva *linga*. Like *Sasashiva*, and the many other forms of Shiva at Elephanta, the *linga* references the all-pervading nature of the deity, but does so in the form of an aniconic (non-representational) symbol.

The resources that it must have taken to conceptualize, excavate, and execute this cave suggests a considerable investment on the part of its patron or patrons. Scholars have suggested that the cave may have been sponsored by Krishnaraja I (who ruled from c. 550 – 575 C.E), a known Shiva devotee and ruler of the Kalachuri kingdom that was active in the region in the sixth and seventh centuries. Krishnaraja's coins have been found at the site, but the extent of the Kalachuris' direct involvement with the cave remains unresolved.



Eastern entrance, Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island (photo: Elidioo, CC BY-SA 4.0)



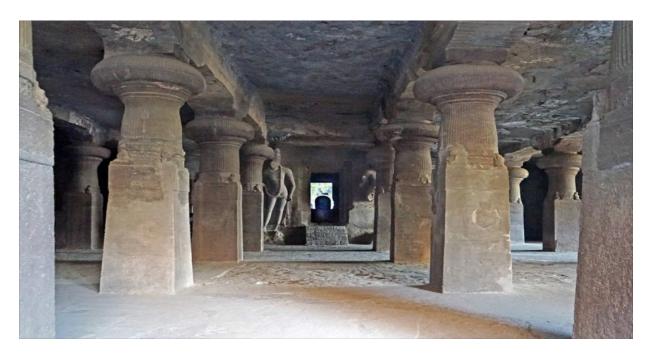
Main features of Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island. Plan adapted from fig. 1, p. 18 of George Michell's "The Architecture of Elephanta".

Photo credits for insets (from left to right): Shiva dances (Jean-Pierre Dalbéra, CC BY 2.0), Shiva as the lord of yogis (Scott McLeod, CC BY 2.0), Shiva subdues Ravana (Sivaraj D., CC BY-3.0), Shiva and Parvati play a game of dice on mount Kailasa (Andy Hay, CC BY 2.0), Ardhanarishvara (Ricardo Martins, CC BY 2.0), Sadashiva (Ronakshah1990, CC BY-SA 4.0), Shiva supports the descent of the Ganges (Sivaraj D., CC BY-SA 3.0), Shiva and Parvati marry (Sivaraj D., CC BY-SA 3.0), Shiva slays Andhaka (Elroy Serrao, CC BY-SA 2.0); Linga shrine (Ricardo Martins, CC BY 2.0).

A pillared hall with a shrine at the end

The interior of the cave measures approximately 130×130 feet.[2] Its pillared hall is lit by natural light from just three openings — one each at the east, the north, and the west ends of the cave. The openings at the east and the north sides of the cave serve as entrances with sunken courtyards and impressive porticoes. The opening on the west opens to a small open-air corridor that leads to a side shrine.

As we enter the cave from the eastern entrance, we encounter an impressive row of tall pillars and a large square shrine situated near the far west end of the cave (see image below). The pillars have fluted tops and cushion capitals and four small seated figures at each corner of their plain rectangular bases. At a height of about sixteen feet, carved beams with brackets that rest on the pillars' capitals travel east to west in the cave's ceiling. With the exception of the nine large bas-reliefs (illustrated in the plan above) and the guardian figures on the shrine and on the cave's south wall, the walls of the cave and of the shrine are undecorated.



Looking towards the west end of the cave at the shrine with the Shiva linga, Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island (photo: Jean-Pierre Dalbéra, CC BY-SA 2.0)

The entire cave and everything in it can be seen as one large sculptural piece that embraces both the character of the hill from which it is carved and the design of built structures that were likely in vogue in the sixth century. The inclusion of the pillars in the cave gives the impression that they are weight-bearing columns that reinforce the roof as they would in a built structure, and that they are aided in that task by the ceiling beams.



View of the *linga* shrine and its guardians before reconstruction, photo taken c. 1875, Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island (photo: public domain)

A shrine for Shiva linga

The shrine near the far west end of the cave is carefully subtracted from the hill to appear free-standing. But the shrine, along with the Shiva *linga* within it, is a part and parcel of the hill. A short set of stairs on all four sides of the shrine leads to four open doorways and there is enough space within the shrine to allow the devotee room to circumambulate the *linga*. When devotees pray to the linga, they are praying to an aniconic representation of Shiva and acknowledging the sacred generative aspect of the universe.

Each of the shrine's four entrances are flanked by majestic guardian figures who are as tall as the shrine. Some of these figures are accompanied by smaller attendants and hierarchic scale is employed to indicate the relative importance of the larger figures.



The linga and the shrine's guardians (each in a "three-bent pose"), Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island (photo: Ricardo Martins, CC BY-2.0)

The guardians are shown wearing elaborate crowns and jewelry including earrings, armbands, necklaces, and belts. Each pair of guardians at each entrance is also shown in the *tribhanga* (three-bent pose) in such a way that they appear to balance one another. The figure to our left in the image above, for example, leans to their left whereas the figure to our right leans to their right. The resulting effect is subtle but provides a remarkable quality of naturalism to the enormous stone figures.

It is difficult to know for certain what the guardians once held in their hands. The extensive damage, particularly to the lower half of these figures and the cave's basreliefs, was caused by artillery training conducted by Portuguese forces in the sixteenth century.





Sadashiva, south wall of Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island (photo: Ronakshah1990, CC BY-SA 4.0)

The many faces of Shiva

If we enter the cave again, this time via the northern entrance, we again encounter the same pillared hall. But as we move further into the cave, a centerpiece in shadow at the far end of the cave comes into view. Here we find a deeply recessed, nearly 21 foot tall, three-headed Shiva known as *Sadashiva* (see above). A fourth head at the rear and a fifth head at the top is implied. Again, tall guardian figures and attendants flank either side of the icon just as they do at the four entrances of the shrine dedicated to the aniconic *linga*.

We only see a part of *Sadashiva*, that is, from the chest upwards, and the suggestion is that the god is emerging from the mountain. The artists have carved the image with such skill that the broad shoulders of the central face appears to seamlessly carry the heads shown in profile. The faces each acknowledge an aspect of Shiva — the image at the center is calm and welcoming while the face to the viewer's left shows Shiva's ferocious aspect. His fierceness is emphasized by a twisted mustache, frowning expression, skulls and snakes in his matted hair, and earrings in the form of snakes. The face on the viewer's right is meant to signify a gentler aspect of Shiva. This face is shown with soft curls, wearing a sweet-tempered smile, and carrying a lotus.

Theatrical opposites

The cave continues exploring Shiva's various aspects in bas-reliefs that are carved in deeply framed niches that are as tall as the height of the cave. Eight sculptural panels — two each at the three entrances into the cave and two flanking the *Sadhashiva* are carved facing one another. Each representation of Shiva is large and impressive and the scenes are filled with subsidiary figures — divine and otherwise — who witness and participate in each episode. The subsidiary figures, even the gods, are rendered much smaller than Shiva.

Shiva impales the demon Andhaka (left) and Shiva and Parvati marry (right), Elephanta's Cave of Shiva, c. 6th century C.E. Gharapuri island (photo: Arath





Menon, CC BY-SA 4.0)
The eight bas-reliefs are as follows:

EAST	Shiva subdues Ravana as the demon shakes mount Kailasa	Shiva and Parvati at home on mount Kailasa
SOUTH	Shiva and Parvati as one (Ardhanarishvara)	Shiva assists in the descent of the Ganges
WEST	Shiva and Parvati marry	Shiva impales the demon Andhaka
NORTH	Shiva dancing	Shiva as lord of the yogis

Chart of bas-reliefs (clockwise from eastern entrance) at Elephanta's cave of Shiva, 6th century C.E., India. Shiva's active moods are marked in purple and his passive moods in blue.

Architectural historian George Michell has suggested that Elephanta's artists intentionally wove an exploration of the active and passive moods of Shiva in the sculptural program of the cave's bas-reliefs. Michell's theory is compelling; in the chart above, purple is used to denote the bas-reliefs that celebrate Shiva's dynamic, energetic, and vigorous moods and the color blue is used to denote calmer episodes. This oppositional formula also extends to the iconic *Sadashiva* with its fierce and gentle aspects, as well as to the *linga* and *Sadashiva* as unmanifested and manifested representations of Shiva respectively.

The bas-reliefs that flank *Sadashiva* at the south wall are somewhat different in their antithetic message. To the viewers' left we find Shiva and the goddess Parvati joined as one, in a manifestation known as *Ardhanarishvara*. As is common in representations of *Ardhanarishvara*, which translates literally to Shiva as half-woman, the deity is presented as a composite male and female figure. Fused at the exact center, the male half of the body is shown leaning on Shiva's *vahana* (vehicle), the bull.

Size: Angkor is Vast as compared to Elephanta, spread across 400 square kilometers with over 70 temples and monuments, the Angkor Archaeological Park contains the remains of architectural wonders that span from the 9th to 15th centuries. The sheer scale of many temples enabled the Khmer to give unprecedented expression (through architectural design) to religious symbolism. Angkor Wat is the symbolic microcosm of the Hindu universe and was essentially the abode of the gods (atop Mount Meru), a heavenly complex, carved in stone, found on earth. Besides the magnificence of the scale of the ruins themselves, one of the real gems of this world heritage site is the iconography and imagery found on a smaller scale in the bas-reliefs.

One of the best bas-reliefs is to be found on the wall of the east gallery of Angkor. The myth of creation, displayed as the Churning of the Sea of Milk unfolds across 49m of continuous panel scenes. The Hindu creation myth is a complex, lively narrative with great visual detail. At first glance it looks like a tug of war with a giant serpent serving as the rope; at the gallery's center you notice the serpent or naga is coiled around a mountain. The gods and demons pull back and forth on the serpent for 1,000 years, churning the cosmic sea to produce the elixir of immortality, amrita. The composition is so skillful that the entire relief appears as a massive chain of movement.

Visiting the galleries of the bas-reliefs can be done at any time of day. As the galleries are sheltered it's a good place to spend time during the monsoon's afternoon showers.

In the panel on the right, we see a representation known as Shiva Gangadhara, that is, Shiva as the bearer of the river Ganga. The river Ganges (also known as Ganga) is personified here as a three-headed goddess in the process of descending to earth via Shiva's matted hair. By supporting goddess Ganga's descent, Shiva softens the considerable force of the river's descent to our world, which would otherwise shatter. Art historian Vidya Dehejia has pointed out that the goddess Parvati, conceivably annoyed at her husband's role in the episode, is shown by the artist as moving away from Shiva in a subtle foreshadowing, perhaps, of disconcert. [In Hinduism, images of the gods are embodiments of the gods and to enter a temple is to enter the home of god. Devotees are happy to take the pilgrimage necessary to see and to be seen by god in an act of darshan (auspicious sight). At Elephanta, in this grand cave temple with Shiva's manifest and unmanifest forms and his fierce and pleasant selves, the intention appears to have been to offer the devotee much more. With each theatrical introduction to Shiva, the devotee is offered again and again the opportunity to honor and to know their god in a multitude of profound



Angkor

Angkor is one of the most important archaeological sites in South-East Asia. Stretching over some 400 km2, including forested area, Angkor Archaeological Park contains the magnificent remains of the different capitals of the Khmer Empire, from the 9th to the 15th century. They include the famous Temple of Angkor Wat and, at Angkor Thom, the

Bayon Temple with its countless sculptural decorations. UNESCO has set up a wideranging programme to safeguard this symbolic site and its surroundings.



Angkor (Cambodia) © Ko Hon Chiu Vincent

Outstanding Universal Value

Brief synthesis

Angkor, in Cambodia's northern province of Siem Reap, is one of the most important archaeological sites of Southeast Asia. It extends over approximately 400 square kilometres and consists of scores of temples, hydraulic structures (basins, dykes, reservoirs, canals) as well as communication routes. For several centuries Angkor, was the centre of the Khmer Kingdom. With impressive monuments, several different ancient urban plans and large water reservoirs, the site is a unique concentration of features testifying to an exceptional civilization. Temples such as Angkor Wat, the Bayon, Preah Khan and Ta Prohm, exemplars of Khmer architecture, are closely linked to their geographical context as well as being imbued with symbolic significance. The architecture and layout of the successive capitals bear witness to a high level of social order and ranking within the Khmer Empire. Angkor is therefore a major site exemplifying cultural, religious and symbolic values, as well as containing high architectural, archaeological and artistic significance.

The park is inhabited, and many villages, some of whom the ancestors are dating back to the Angkor period are scattered throughout the park. The population practices agriculture and more specifically rice cultivation.

Criterion (i): The Angkor complex represents the entire range of Khmer art from the 9th to the 14th centuries, and includes a number of indisputable artistic masterpieces (e.g. Angkor Wat, the Bayon, Banteay Srei).

Criterion (ii): The influence of Khmer art as developed at Angkor was a profound one over much of South-east Asia and played a fundamental role in its distinctive evolution. **Criterion (iii):** The Khmer Empire of the 9th-14th centuries encompassed much of South-east Asia and played a formative role in the political and cultural development of the region. All that remains of that civilization is its rich heritage of cult structures in brick and stone.

Criterion (iv): Khmer architecture evolved largely from that of the Indian subcontinent, from which it soon became clearly distinct as it developed its own special characteristics, some independently evolved and others acquired from neighboring cultural traditions. The result was a new artistic horizon in oriental art and architecture. **Integrity**

The Angkor complex encompasses all major architectural buildings and hydrological engineering systems from the Khmer period and most of these "barays" and canals still

exist today. All the individual aspects illustrate the intactness of the site very much reflecting the splendor of the cities that once were. The site integrity however, is put under dual pressures:

- endogenous: exerted by more than 100,000 inhabitants distributed over 112 historic settlements scattered over the site, who constantly try to expand their dwelling areas;
- 2. exogenous: related to the proximity of the town of Siem Reap, the seat of the province and a tourism hub.

Authenticity

Previous conservation and restoration works at Angkor between 1907 and 1992, especially by the École Française d'Extrême-Orient (EFEO), the Archaeological Survey of India, the Polish conservation body PKZ, and the World Monuments Fund have had no significant impact on the overall authenticity of the monuments that make up the Angkor complex and do not obtrude upon the overall impression gained from individual monuments.

Protection and management requirements

The property is legally protected by the Royal Decree on the Zoning of the Region of Siem Reap/Angkor adopted on 28 May 1994 and the Law on the protection of the natural and cultural heritage promulgated on 25 January 1996, the Royal Decree on the creation of the APSARA National Authority (Authority for the protection of the site and the management of the Angkor Region) adopted on 19 February 1995, the No. 70 SSR government Decision, dated 16 September 2004 providing for land-use in the Angkor Park: "All lands located in zone 1 and 2 of the Angkor site are State properties", and the sub-decree No. 50 ANK/BK on the organisation and functioning of the APSARA National Authority adopted on 9 May 2008, specifically provided for the establishment of a Department of Land-use and Habitat Management in the Angkor Park. In order to strengthen and to clarify the ownership and building codes in the protected zones 1 and 2, boundary posts have been put in 2004 and 2009 and the action was completed in 2012.

As off 1993, the ICC-Angkor (International Coordinating Committee for the Safeguarding and Development of the historic site of Angkor) created on 13 October 1993, ensures the coordination of the successive scientific, restoration and conservation related projects, executed by the Royal Cambodian Government and its international partners. It ensures the consistency of the various projects, and defines, when necessary, technical and financial standards and calls the attention of all the concerned parties when required. It also contributes to the overall management of the property and its sustainable development.

The successful conservation of the property by the APSARA National Authority, monitored by the ICC-Angkor, was crowned by the removal of the property from the World Heritage List in danger in 2004.

Angkor is one of the largest archaeological sites in operation in the world. Tourism represents an enormous economic potential but it can also generate irreparable destructions of the tangible as well as intangible cultural heritage. Many research projects have been undertaken, since the international safeguarding program was first launched in 1993. The scientific objectives of the research (e.g. anthropological studies on socio-economic conditions) result in a better knowledge and understanding of the history of the site, and its inhabitants that constitute a rich exceptional legacy of the intangible heritage. The purpose is to associate the "intangible culture" to the enhancement of the monuments in order to sensitize the local population to the importance and necessity of its protection and preservation and assist in the development of the site as Angkor is a living heritage site where Khmer people in general, but especially the local population, are known to be particularly conservative with respect to ancestral traditions and where they adhere to a great number of archaic cultural practices that have disappeared elsewhere. The inhabitants venerate the temple deities and organize ceremonies and rituals in their honor, involving

prayers, traditional music and dance. Moreover, the Angkor Archaeological Park is very rich in medicinal plants, used by the local population for treatment of diseases. The plants are prepared and then brought to different temple sites for blessing by the gods. The Preah Khan temple is considered to have been a university of medicine and the NeakPoan an ancient hospital. These aspects of intangible heritage are further enriched by the traditional textile and basket weaving practices and palm sugar production, which all result in products that are being sold on local markets and to the tourists, thus contributing to the sustainable development and livelihood of the population living in and around the World Heritage site.

A Public Investigation Unit was created as « measure instrument » for identifying the needs, expectations and behaviors of visitors in order to set policies, monitor its evolution, prepare a flux management policy and promote the unknown sites. The management of the Angkor Site, which is inhabited, also takes into consideration the population living in the property by associating them to the tourist economic growth in order to strive for sustainable development and poverty reduction. Two major contributions supporting the APSARA National Authority in this matter are:

- The Angkor Management Plan (AMP) and Community Development Participation Project (CDPP), a bilateral cooperation with the Government of New Zealand. The AMP helps the APSARA National Authority to reorganize and strengthen the institutional aspects, and the CDPP prepares the land use map with an experimental participation of the communities and supports small projects related to tourist development in order to improve the income of villagers living in the protected zones;
- 2. The Heritage Management Framework composed of a Tourism Management Plan and a Risk map on monuments and natural resources; a multilateral cooperation with the Government of Australia and UNESCO. Preliminary analytical and planning work for the management strategy will take into account the necessity to preserve the special atmosphere of Angkor. All decisions must guarantee physical, spiritual, and emotional accessibility to the site for the visitors.

Elephanta Caves

The 'City of Caves', on an island in the Sea of Oman close to Bombay, contains a collection of rock art linked to the cult of Shiva. Here, Indian art has found one of its most perfect expressions, particularly the huge high reliefs in the



main cave.

Elephanta Caves © UNESCO https://whc.unesco.org/en/list/244/
Outstanding Universal Value

Brief synthesis

The Elephanta Caves are located in Western India on Elephanta Island (otherwise known as the Island of Gharapuri), which features two hillocks separated by a narrow valley. The small island is dotted with numerous ancient archaeological remains that are the sole testimonies to its rich cultural past. These archaeological remains reveal evidence of occupation from as early as the 2nd century BC. The rock-cut Elephanta Caves were constructed about the mid-5th to 6th centuries AD. The most important among the caves is the great Cave 1, which measures 39 metres from the front entrance to the back. In plan, this cave in the western hill closely resembles Dumar Lena cave at Ellora, in India. The main body of the cave, excluding the porticos on the three open sides and the back aisle, is 27 metres square and is supported by rows of six columns each.

The 7-metre-high masterpiece "Sadashiva" dominates the entrance to Cave 1. The sculpture represents three aspects of Shiva: the Creator, the Preserver, and the Destroyer, identified, respectively, with Aghora or Bhairava (left half), Taptapurusha or Mahadeva (central full face), and Vamadeva or Uma (right half). Representations of Nataraja, Yogishvara, Andhakasuravadha, Ardhanarishwara, Kalyanasundaramurti, Gangadharamurti, and Ravanaanugrahamurti are also noteworthy for their forms, dimensions, themes, representations, content, alignment and execution.

The layout of the caves, including the pillar components, the placement and division of the caves into different parts, and the provision of a sanctum or *Garbhagriha* of sarvatobhadra plan, are important developments in rock-cut architecture. The Elephanta Caves emerged from a long artistic tradition, but demonstrate refreshing innovation. The combination of aesthetic beauty and

sculptural art, replete with respondent *Rasas*, reached an apogee at the Elephanta Caves. Hindu spiritualistic beliefs and symbology are finely utilized in the overall planning of the caves.

Criteria (i): The fifteen large reliefs surrounding the lingam chapel in the main Elephanta Cave not only constitute one of the greatest examples of Indian art but also one of the most important collections for the cult of Shiva. **Criteria (iii):** The caves are the most magnificent achievement in the history of rock-architecture in western India. The Trimurti and other colossal sculptures with their aesthetic setting are examples of unique artistic creation.

Integrity

All the archaeological components in the Elephanta Caves are preserved in their natural settings. There is further scope to reveal archaeological material and enhance information by exposing the buried stupas. At the time of the listing the need was noted to safeguard the fragile site from nearby industrial development. Currently, saline activity and general deterioration of rock surface are affecting the caves. Management of the property would be enhanced through the adoption of a Conservation Management Plan to guide restoration and conservation works.

Authenticity

The authenticity of the property has been well maintained since its inscription on the World Heritage List, despite certain repairs on the façade and pillars that have been carried out to ensure the structural stability of the monument. Besides the caves, Elephanta Island possesses archaeological remains from as early as the 2nd century BC and from the Portuguese period, as witnessed, respectively, by stupas buried towards the eastern side of the hillock and a canon located at its top. Moreover, the caves are preserved in the form of monolithic temples, *sarvatobhadra*

garbhgriha (sanctum), mandapa (courtyard), rock-cut architecture, and sculptures. Since inscription, a number of interventions have been made to enhance visitors' experience and to conserve the site. These include the construction of pathways, conservation of fallen and broken pillars, conservation of fallen and collapsed facades, construction of flight of steps leading to the caves from island's jetty, repair to the Custodian's Quarters, and setting up of a Site Information Centre.

Management and protection requirements

The property is protected primarily by the Archaeological Survey of India, which also undertakes the management of the Elephanta Caves with the assistance of other departments, including the Forest Department, Tourism Department, MMRDA, Urban Development Department, Town Planning Department, and the Gram panchayat of the Government of Maharashtra, all acting under the various legislations of the respective departments, such as the Ancient Monuments and Archaeological Sites and Remains Act (1958) and Rules (1959); Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act (2010); Indian Forest Act (1927), Forest Conservation Act (1980); Municipal Councils, Nagar Panchayats and Industrial Townships Act, Maharashtra (1965); and Regional and Town Planning Act, Maharashtra (1966).

Sustaining the Outstanding Universal Value of the property over time will require completing, approving and implementing a Conservation Management Plan to guide restoration and conservation works; addressing saline activity and the general deterioration of the caves' rock surfaces using internationally recognised scientific standards and techniques; safeguarding the property from nearby industrial development; and considering exposing the buried stupas. The restoration of some of the pillars that was carried out in 1960s needs to be dismantled and redone as cracks have developed. Additional resources (technical specialist advice) and funding are required to conserve this site and protect the archaeology.

THE PORTION BELOW IS A REPRODUCTION OF THE EXCELLENT ARTICLE BY THE AUTHOR MENTIONED BELOW

Elephanta Caves: An Overview
VISUAL AND MATERIAL ARTSBUILT SPACES
in Overview-Published on: 22 April 2016

Dulari Qureshi is an art historian and a former professor at Dr Babasaheb Ambedkar Marathwada University. She is noted for her expertise on the monuments of Western Deccan, Aurangabad district in particular. "Art and Vision of Aurangabad Caves" and "Tourism Potential in Aurangabad" are among her many publications.

History of the Caves

Unlike all other caves of western India, these cave temples have no authentic history; much of what has been written on them has been based on conjectures and assumptions by various scholars and historians. There has been a controversy around the dating of Elephanta but no one as yet has been able to arrive at any definite conclusions.

Unfortunately, a large stone inscription found on the site by the Portuguese has been irretrievably lost. Diogo de couto made the following entry in the Annals, "When the Portuguese took Bacain and its dependences they went to this pagoda and removed a famous stone over the entrance that had an inscription of large and well written characters, which was sent to the king, after the Governor of India had in vain endeavored to find out any Hindu or Moor in the East who could decipher them. And the king D. Laao-III also used all his endeavors to the same purpose, but without any effect, and thus the stone remained there and now there is no trace of it". Considering the fact that the Brahmi script was first deciphered by James Prinsep in 1837, an official

of the Calcutta Mint and Secretary of the Asiatic Society of Bengal, it is not surprising that the Portuguese king could not find anyone who could read the inscription.

Since no inscription now exists, the dating of the Elephanta caves is purely conjectural as mentioned earlier. Many opinions have been expressed on their chronology. Besides the early scholars like James Burgess, James Fergusson, Stella Kramrisch and Hirananda Sastri who have given dates ranging from the 5th century A. D. to 8th century A. D. (they have however not justified these dates), other scholars like Dr. V.V. Mirashi, Dr. Walter Spink and Dr. Y.R. Gupte have very lucidly discussed the dating and have tried to logically prove their contention. The caves have been attributed by Y.R. Gupte to the Maurya dynasty. dating, Gupte's accepts but attributes excavation to the Kalachuris. Benjamin Rowland supports James Burgess's dating of the latter part of the 8th or the beginning of 9th cent. A.D. Fergusson placed them in 750 A.D. Stella Kramrisch considers them of Rashtrakuta period and places them the 8th cent A.D. However, none of them discuss the chronology.

Dr. Mirashi however, who dates the caves to the early half of the 7th century, gives arguments which are partly historical and religious affiliation. Не disputes partly those of contention that the cave was excavated by the Mauryas of the Konkan on the grounds that since they were merely feudatories of the Kalachuris, they could not have commanded the resources required for the excavation of such a rock temple. He further contends that though the Chalukyas of Badami conquered Gharapuri in the second half of the 7th century A.D., the caves however cannot be attributed to them as they were devotees of Vishnu and therefore could not have carved Shiva temples.

According to Walter Spink, in his *The Great Cave at Elephanta: A Study of Sources*, the ownership of the caves has been attributed to the Kalachuri dynasty. Dr. Shobhana Gokhale's paper concluded that copper coins issued by King Krishnaraja, the great Kalachuri ruler, have been found in fair numbers in western India in the mid-6th century. Thousands of coins have turned up on the island of Gharapur. With the logical support of coins discovered at Elephanta, Spink contends that Elephanta is a mid-6th century Kalachuri monument sponsored by the great king Krishnaraja.

Dr. Ramesh Gupte has categorically refuted both the arguments of Dr. Mirashi as well as Dr. Spink and asserted strongly the influence of Chalukyas due to the presence of maniyajnopavita (pearled sacred thread) as the mani (pearl) and pushpa (flower) yajnopavita adorn all the sculptures of

Chalukyas such as those at the Aihole, Badami and Pattadakal temples. Other indications of Chalukya influence are the armlets (keyuras) with *kirti-mukha* (Face of Glory), and also the presence of Saptamatrikas, Karttikeya and Shiva, as it is well known that the Chalukyas were their followers. Furthermore, the Chalukyas in the 6th century A.D. had defeated the Kalachuris. Later dynasties like the Rashtrakutas and the Gujarat Sultanate surrendered Gharapuri to the Portuguese. The Portuguese later left in 1661 as per the marriage treaty of Charles II of England with Catherine of Braganza, daughter of King John IV of Portugal. This marriage shifted the possession of the island to the British Empire.

However, during the rule of the Portuguese the caves were grossly vandalized by them and damaged to a huge extent. They removed the valuable inscription mentioned earlier from its place and used the sculptural reliefs as target practice, thus marring a great number of sculptures.

Cave Details

As mentioned earlier, the island has two group of caves in the rock architecture style. The first group consists of five Hindu caves while the second group of two Buddhist caves.

The Main Cave or Cave-I also called the Shiva Cave-I or the Great Cave is of huge dimensions: it is 38.40 meters deep and 37.80 meters wide. Rows of columns divide the hall into corridors (Fig.3). Twenty-four columns support the ceiling of the hall. At the back end of the temple is the famous Maheshamurti, while the shrine with the linga, the main object of worship in a Saiva temple, is on the right side.



Fig.3. Main Cave-1

(Photo courtesy: American Institute of Indian Studies, Gurgaon) The ground plan of the temple clearly indicates that the northern entrance was the principal one. Though Maheshamurti is considered by most to be the principal object of worship, it is the linga shrine which stands facing the Nandi that is the main object of worship. The roof of the column has concealed beams supported by stone columns joined together by capitals. The cave entrance is aligned with the north-south axis, unusual for a Shiva shrine which generally has an east-west axis.

The northern entrance, which has 1000 steep steps, is flanked by two panels of Shiva dated to the Gupta period. The left panel depicts Yogishvaraj (Shiva as the Lord of Yoga) and the right shows Nataraja (Shiva as the Lord of Dance). The central shrine is a free standing square cell with four entrances, located in the right section of the main hall (Fig.4). There are smaller shrines located in the east and west end of the caves. The eastern sanctuary serves as the ceremonial entrance.

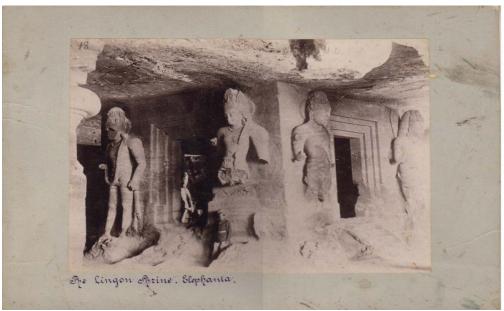


Fig.4. Linga shrine with four entrances (Photo courtesy: commons.wikimedia.org)

The chief attraction of Elephanta is the sculptures in the main temple. These are carved in fairly deep recesses in almost full relief. Generally it is best to begin from the first sculptural panel left of the northern entrance, which is now the principal and only entrance, and go clockwise in the same manner as Hindus circumambulate while visiting a temple. As one stands at the northern entrance, the magnificent sculpture of Maheshmurti overwhelms everything else.

Maheshamurti, which is reached through a colonnade of pillars, dominates Elephanta. The following are some details of the sculptures.

Shiva as Mahayogi - Shiva is seated in a yogic pose, his eyes look practically closed (Fig.5). His crown of matted hair is decorative. His hair falls in ringlets on either shoulder. He wears a necklace of beads. Both his arms are destroyed from near the shoulder and the legs too are destroyed. in padmasana (lotus pose) seated on a lotus stalk held by two Nagas. A number of figures are carved on either side of Shiva, including Vishnu and Brahma. As one enters the main temple of Elephanta, this figure is situated on the left. The sculpture has been a subject of much controversy as some identify it as Yoga-Dakshinamurti, while others identify it as Lakulisa.



Fig.5. Shiva as Mahayogi (Photo courtesy: American Institute of Indian Studies)

Ravananugraha-Murti - This panel depicts the storv Ravana's humiliation at the hands of the almighty Shiva and his submission to the Supreme Deity, whereupon Shiva confers a boon upon him (Fig.6). Ravana had humiliated and defeated the powerful Kubera and become the Lord of Lanka. Flushed with his fresh victory, he was flying over the snow-clad mountains of the Himalayas, when he located a beautiful garden and proceeded to go there. However, his vehicle was not permitted to go further as Uma and Maheshvara were engaged in sports. Ravana insulted Nandikeshvara, the leader of Siva's hosts. Enraged, Ravana then got under the mountain with the intention of lifting the mountain from its base and overthrowing it. He shook the great mountain. Shiva gently put his foot on the ground and Ravana became imprisoned under the snow-clad mountains. Repentant, Ravana praised Shiva. Pleased with his devotion, Shiva conferred a boon

on him and presented him with a sword while allowing him to leave.



Fig.6. Ravanugrahamurti

(Photo courtesy: American Institute of Indian Studies, Gurgaon) This panel is very badly damaged. Uma is seated with Shiva on Mount Kailash, their abode. Maheshwara had originally eight hands. He wears a decorative crown, necklaces, armlets and a waist-belt. His hair falls in curls on either side. His left leg is folded. The figure of Uma is badly mutilated. Ravanaguhamurti at Kailash in Ellora is far superior to this panel as the panic of Parvati and the other characters present is depicted very realistically.

Uma-Mahesvara-Murti - In this panel Shiva and Sakti are emanations of the undivided absolute (Fig.7). Shiva here symbolizes the passive male principle, while Uma or Parvati represents the active female principle, the principle of energy.

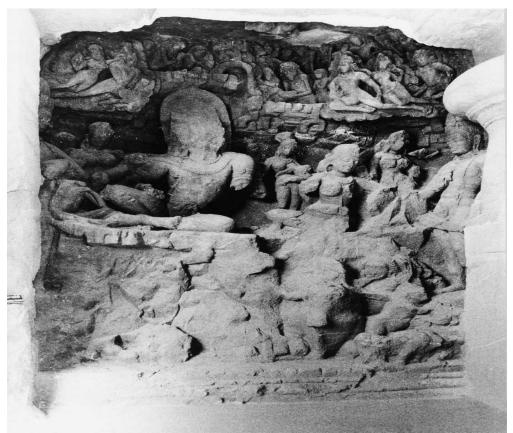


Fig.7. Umamaheshvaramurti

(Photo courtesy: American Institute of Indian Studies, Gurgaon) Unfortunately this panel is in bad condition. Uma and Mahesha are seated in Kailash. Shiva's countenance is defaced. He sits in the *ardha-paryankasana* (half-seated posture), reclined to the left. The figure of Uma too is damaged. Below Uma, Nandi and a winged dwarf are seen, while above them are flying figures and male and female attendants on either side.

Ardhanarisvara-Murti - This is the form of Shiva as half man and half woman (Fig.8). It is said that Brahma created the Prajapatis, who were all male, and assigned to them the task of creation. He was baffled when they were unable to do so and promptly proceeded to meet Shiva to seek counsel for this problem. Shiva appeared before him in the form Ardhanavisara, half man and half woman. Brahma immediately realized his error and created a woman.

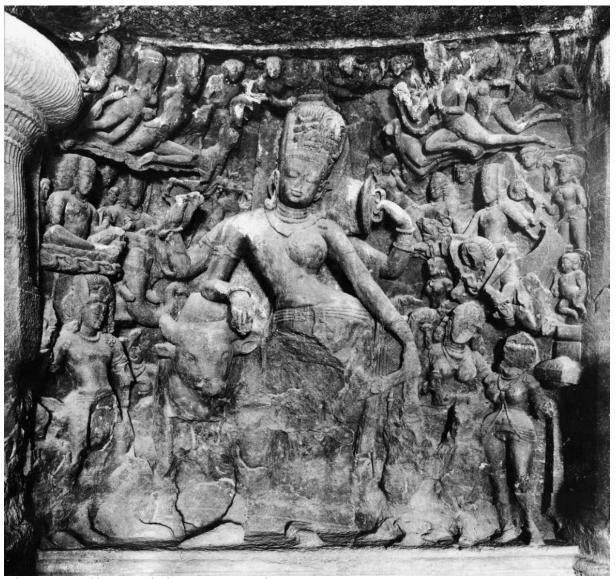


Fig.8. Ardhanarishvaramurti

(Photo courtesy: American Institute of Indian Studies, Gurgaon) In another story with a similar theme, sage Bhringi refused to worship Parvati and only worshipped Shiva. Parvati undertook severe austerities and became one with Iswara (Shiva), but still Bhringi only circumambulated Iswara. Parvati incensed rid Bhringi of his flesh and blood and turned him into a skeleton. He could not stand and Shiva in compassion gave him a third leg. Eventually, Shiva helps them reconcile while emphasizing the unity of the male-female principles.

The Elephanta Ardhanarisvara looks elegant and impressive. The four-handed Ardhanarivsara stands majestically on Nandi. The left half of the sculpture, which represents Parvati, has a breast, exaggerated rounded hips and is shown holding a mirror. On the right side, Shiva's crown has a crescent and his body is more

muscular. He holds a cobra in his hand. There are a number of other interesting figures in the panel of various divinities seated on their mounts: Indra is seated on Airavata, Brahma on a lotus, Varuna on a crocodile, Kartikeya on a peacock and Vishnu on Garuda. This is one of the most unique panels in terms of its grace and perfect balance.

Maheshmurti - Right in the center, as one enters the cave temples, is one of the grandest compositions of Elephanta, the Maheshmurti (Fig.9). Shiva here is portrayed as the creator, protector and destroyer. The right half-face is benign, peaceful and feminine, depicting Shiva's aspect as a creator. The central face shows introspection and reveals the protective aspect. The left-half face is hideous, displaying great anger. It symbolizes his power to dissolve the universe. The three aspects of divinity are combined in one.



Maheshamurti (Photo courtesy: American Institute of Indian Studies, Gurgaon)

This sculpture is majestic not only in its conception but also in its size: it stands tall at 18 feet. The central bust wears a decorative crown. The coils of matted hair are held within this elegantly carved crown. The chief element is its kirtimukha decoration, a typically Chalukyan element. The whole crown is adorned with elaborate jewelry comprising of pearls and diamonds. On the right side of the crown is a half moon. Kirtimukha is a special emblem of Shiva believed to be guaranteeing the true devotee with peace.

The central face of the deity is executed in very high relief. The other two side faces appear to recede in the background compared to it. The sculpture represents Mahadeva, the Great Lord as Tatpurusha, Aghora and Vamadeva.

Gangadhara-Murti Next to the Maheshmurti Gangadhara-murti panel, which narrates the story of the descent of the river Ganges from heaven to the earth (Fig. 10). The king Bhagirath practiced severe austerities to win over the river Goddess Ganga, to persuade her to leave her heavenly abode and descend on the Earth. Ganga was pleased and agreed to leave her celestial abode but requested Bhagirath to persuade somebody to receive her fall, as otherwise the force of her descent on the earth would split it in half. Bhagirath again undertook severe penance to persuade Shiva to receive the powerful descent of the waters of the mighty river. Shiva was pleased and granted his request. To humble Ganga, who fell with great force, Shiva made her wind through his matted hair—which is symbolic of the variegated universe—thus, preventing her descending. Bhagirath once again praved to Shiva, requesting him to allow Ganga to come down to the earth. Emerging from Shiva's locks, Ganga finally falls on the earth.



Gangadharmurti(--Photo: American Institute of Indian Studies, Gurgaon) In sculptural form Ganga appears in the matted hair of the mighty Shiva. Because Ganga descended on the earth due to Bhagirath's severe austerities, she is called Bhagirathi, the daughter of Bhagiratha. In the Elephanta panel, Shiva is seen standing with the right leg reclined. His left leg is bent a little at the knee. Shiva is of tall stature and slim body. His torso is inclined to the left. Over the head of Shiva are three heads representing the three sacred rivers of India, Ganga, Yamuna and Saraswati. Shiva has four hands. On the left of Shiva, Parvati stands gracefully in the *tribhanga* pose. Her diaphanous lower garment is held in place by a girdle. She wears a simple crown and a few select ornaments.

This is one of the most beautiful panels at Elephanta. It is a masterpiece composition. The main attraction are the figures of Shiva and Parvati. There is a rhythm which binds these two figures together in a harmonious whole.

Kalvanasundara-Murti of Shiva-Parvati) (Marriage - According to the Shanti Parva of the Mahabharata, the main character Daksha, one of the twelve Prajapatis, performed a great sacrifice to which all the gods were invited except Shiva, his son-in-law, the husband of his daughter Sati. This angered Sati, who insisted on Shiva's attending the sacrifice, but Shiva declined. Sati then went to the sacrifice alone but was humiliated by her father, following which she jumped into the sacrificial pit. When the story of his wife's humiliation reached Shiva, he was inconsolable and created the terrible Virabhadra, who destroyed Daksha's sacrifice and made him supplicate to Shiva.

Sati was reborn as the daughter of Himavan and Menaka, and once she came of age she began to practice penance to be blessed once again with Shiva as a spouse. Shiva was engaged in severe austerities. At the time the asura Taraka was getting stronger and becoming a menace to the gods. It was said that he would be destroyed by Shiva's son. So Shiva had to be persuaded to give up his austerities and get into wedlock. Kamadeva was entrusted with this task. As he was the God of Love, he used his arrows on Shiva successfully. Shiva opened his eyes and saw Parvati, and the marriage was celebrated with great ceremony. Brahma acted as the sacrificial priest, and Vishnu and Lakshmi gave Parvati away in marriage to Shiva.

The marriage of Shiva and Parvati is beautifully delineated at Elephanta. The figure of Parvati looks young, charming and full of joy and contentment. She is shown as a traditional young bride with her head bowed down. Adding to her charm is the small crown she wears and the *stanahara* (a stringed necklace). The figure of Shiva is well-matched to that of Parvati. He looks young, tall, slim and well-formed. He wears a simple crown and his curly hair falls on his shoulders.



Kalyanasundaramurti

Brahma, as a priest, sits on the left of Shiva, close to the sacrificial fire. Vishnu is seen behind. Parvati's father Himavan is just behind her. Close to him stands a very graceful figure, who is probably Menaka. There are several other figures attending the divine marriage including the flying figures above.

Andhakasuravadha Murti (The killing of the Demon Andhaka) - This theme of the Lord Shiva killing the demon Andhaka is popular even at Ellora. The story goes that the demon Andhaka who had become extremely powerful and was harassing the gods, had heard about the beauty of Parvati and cultivated a desire for her. He dispatched a demon Nila to kill Shiva. Nila assumed the form of a huge ferocious elephant to fulfill his task. Virabhadra, the mighty son of Shiva, slayed him and presented the elephant skin to his father. Shiva, joined by Vishnu and others, united in battle against Andhaka. However, Andhaka had special power that created a problem for Shiva. Out of every drop of his blood that would spill in the battle, another demon would come to life. To solve this problem Shiva created Yogesvari and each God created his respective Shakti (Brahma-Brahmani, Vishnu-Vaishnavi, Varaha-Varahi etc.) and in this way the Saptamatrikas (seven divine mothers) were created. They drank up the demon's spilt blood. Vishnu killed all the subsidiary demons and when Shiva was about to kill Andhaka, the demon begged for forgiveness and thus obtained his pardon and grace. Shiva made him commander of his ganas (attendants) and he was named Bhringisha or Bhringirishi.

Andhaka's blindness is symbolic and emphasizes the superiority of knowledge over ignorance and darkness. In the Elephanta panel Shiva is seen in an aggressive mood. His whole stance gives the impression of belligerence (Fig. 12). Unfortunately, both the sculpture's legs are broken. His jatamukuta shows a skull, cobra and a half moon. The eyes seem to protrude out of the sockets while the third eye is open in anger. The hair falls on his He wears a decorative necklace. armlet a *mundamala* (a garland of skulls). He has eight hands. The elephant Nila is seen on his right. Virabhadra is seen presenting the elephant skin. A sword is held in a threatening manner in the right hand. In one left hand is held a skull cup for Andhaka's drops of blood. A number of flying figures carrying offerings are carved. An object in the centre looks like a stupa with an umbrella. The flying couples on the sides are beautifully carved.



Andhakasurvadhamurti

Nrittamurti Shiva - Shiva is the divine master of dance. In Bharata's *Natyashastra* where 108 kinds of dance poses are listed, Shiva is proclaimed as the Nataraja, or king of dance. Dance is almost like a form of magic in its ability to transform the personality of the dancer, who appears to be possessed by supra-terrestrial powers in the process. Like yoga, dance induces ecstasy, the mergence with and experience of the divine. Dance is considered to be an act of creation.

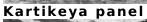


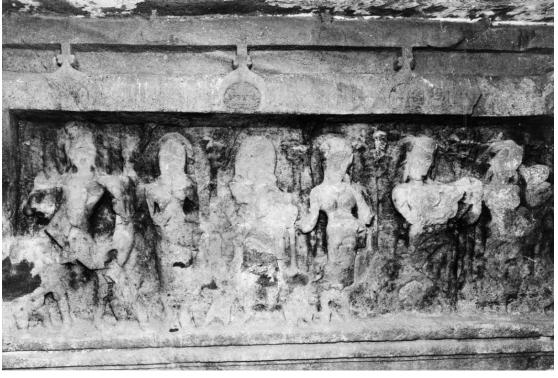
Nrttamurti

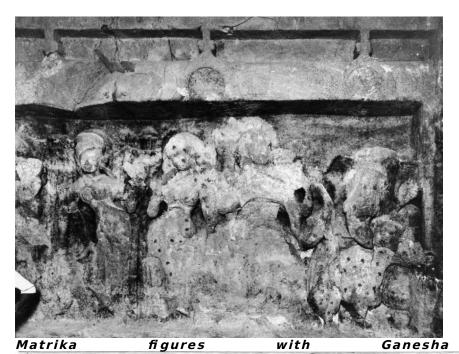
The dancing figures of Shiva as Nataraja are some of the most attractive manifestations of the Indian art tradition. The dance Elephanta is depicted at what is described as lalitam (Fig. 13). The figure's legs are broken as are some of the hands. Though the figure is mutilated, it has not lost its charm. The figure pulsates with life and movement, and has a rhythm and grace which even the broken limbs are not able to conceal. The face which is slightly tilted towards the left hand adds further charm to the figure. A number of musicians are shown seated around Nataraja, though in a damaged condition. The figure of Parvati also looks graceful. Other gods seen are Brahma, Ganesha and Kumara. Besides these there are other

smaller panels of Kartikeya, Matrikas, Ganesa, Dvarapalas, etc



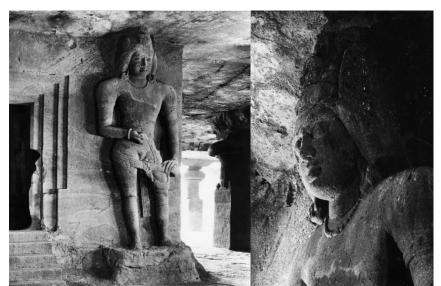






BELOW





Dvarapala (Photo courtesy: American Institute of Indian Studies, Gurgaon). Dvarapala (Photo courtesy: American Institute of Indian Studies, Gurgaon)

Cave 2 is located to the southeast of the Great Cave. It faces east and has a shrine at its northern end. The cave has four pillars and is badly damaged. Traces of sculptures still remain. The damage was caused by the heavy monsoons in the region, especially due to the resultant accumulation of water.

Cave 3 is towards the south of Cave 2 with six columns and two pilasters visible at the entrance. These pillars are in fairly good condition as they have been reconstructed. The veranda is 80 meters in width and 35 meters in length. At the north end of the veranda is a large raised chamber supported by four octagonal pillars and two pilasters. The capitals of these pillars are similar to those in the main cave though with one difference. The amalaka or cushion member here looks compressed. The dimensions of the chamber are impressive. It is 11.9 meters in width and 6.7 meters in depth. The walls of the chamber are bare.

Cave 4 has a plan that is similar to Cave 3. The veranda is 15.2 meters in breadth. Carved into the back wall are three cells and a linga shrine. The shrine is 5.7 meters in width and 6 meters in depth. The dwarapalas (gatekeepers) that once existed here have now disappeared. On either side of the veranda are chambers which are 4.6 meters square in area. Each of them are supported by two pillars and two pilasters. The doors of the side chamber shrines have chaitya ornamentation.

In front of these caves is a ravine that one needs to cross and ascend to a height of about 30 meters to reach caves 5 and 6 which are located in the eastern hill. Cave 5 has a veranda and a shrine with a yoni and linga. Cave 6, further north-east, appears to be unfinished

Shrine in the East wing - In the east wing of the main cave is another shrine similar in plan to Ramesvara (Cave No.21) at Ellora. There are also sculptures of Ganesha and Saptamatrikas.

West Wing - There is a chapel in the west wing. In the veranda is a sculpture of Shiva as a yogi (Fig.15). To the south of the linga shrine is a six- handed dancing figure of Shiva accompanied by Vishnu riding Garuda, Yama on his buffalo and Brahma (Fig.16). They are now in a damaged condition

a damaged condition.

Shiva as Yogi LEFT To RIGHT Shiva accompanied by Vishnu, Yama and Brahma

Angkor was built as a symbol to exhibit the greatness of a Monarch to the world whereas Elephanta had other purpose as mentioned below. The cave sculptures were carved out of volcanic rock as a monolith — from top to bottom and back to front. As you enter, the first thing you notice are the pillars that divide the cave into squares, apparently in the shape of a mandala. The pillars near the entrance, however, are not original. Badly damaged over time, they were reconstructed in the 1960s. The caves were built primarily for tradesmen, seafaring men, and fisher-folk as a mere stopover, which may explain why there is little else on this island. They are labelled sequentially from Cave 1 to Cave 7.

Cave 1 is the best preserved and, at 39 metres long, the largest. The highlight of the island, it contains impressive sculptures of Shiva in 10 different avatars. The other caves are more dilapidated but house idols like a Shivaling, Ganesh, Karthik, and Ashta Matrikas. There is even a Buddhist stupa on site.

The highlight of the island has to be the 10 forms of Shiva in Cave 1. Each is fascinating in its own right, but three are not only glorious to behold but also tell incredible stories.

Still worshipped as it has been for nearly a millennium, the Shivaling (the phallic stone idol that represents Shiva) today sees about 30,000 devout visit on Mahashivratri (the birthday of Lord Shiva).

Shiva as Bridegroom

Well-preserved enough for the facial expressions to be clearly evident are the shy face of Parvati, the bride and to her left, serene and proud, the bridegroom Shiva. In the representation of Hindu idols, wives stand to the left of their husbands; because of this, we know that, in this avatar, they are yet to be wed. Brahma, the god of creation, officiates at this wedding. Vishnu and Himavat, Parvati's father, are wedding guests. Chandra is holding the kalash or the auspicious pot, and a retinue of gods hovers above to bless the couple.

The marked Greek and Roman influences in the rendering of the hair and jewellery in these sculptures is thanks to the ancient trade routes between Elephanta and Greece and Rome. It is striking how these influences render a common Hindu mythological scene anew.

Maheshmurti or Shiva as Trimurti

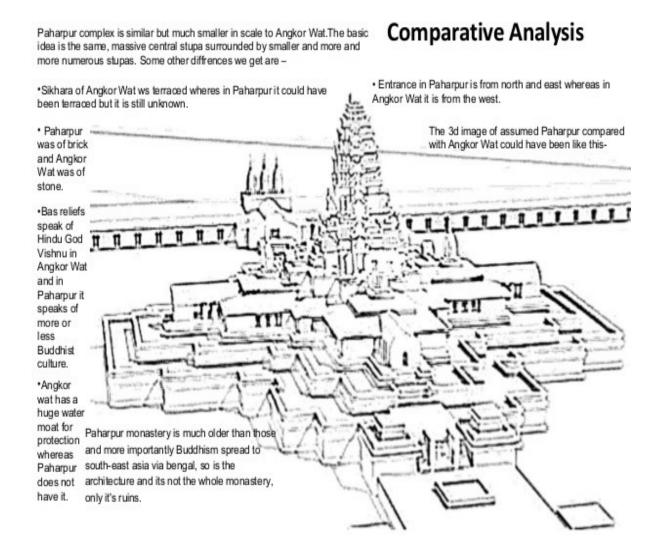
This is the best-known of all the idols here with an impressive height of seven metres or 22 feet. At first glance, this sculpture may remind you of the Bayon temple in Angkor Wat, Cambodia. The central avatar of Shiva is a doppelganger of King Jayavarman VII or the Lokeswara Bodhisatva in the Bayon temple. The three faces of Shiva signify creation, protection, and destruction. Not only is the hair different for each sculpture, but the facial features are also unusual, reminiscent of Buddhist sculpture. Each avatar holds something different — a flower in the first, a fruit in the second, and a cobra in the last. There were meant to be five faces; one more at the back to signify regeneration and a face on top to signify salvation, but these were never built.

Legend has it, at a tea party for King Edward VII held on the island, the British actually clambered on top to see if there were two more faces. They likened the sculptors to Amazons, based on the height of these sculptures. It was only after this that the Archaeological Society of India (ASI) was formed and the caves were declared a heritage monument in 1909.

The remaining sculptures show Shiva in various avatars — from an angry warrior to a householder who cheats at dice, from a voluptuous and androgynous Shakti to a sagacious Yogi. Once done with the caves, you could hike up to the stupa or to see the cannons the British left behind. You can also grab a bite to eat or get a drink at one of the cheap and cheerful restaurants along the steps.

CHAPTER VII

Comparison between Angkor Wat, Borobudur and Paharpur



Comparison between Angkor Wat and Paharpur-Understanding Paharpur and Angkor Vat

Introduction: Though just one of hundreds of surviving temples and structures, the massive Angkor Wat is the most famed of all Cambodia's temples—it appears on the nation's flag—and it is revered for good reason. The 12th century "temple-mountain" was built as a spiritual home for the Hindu god Vishnu. Sompura

monastery(STUPA) and Borobodur are however both built as Buddhist "Temples" from scratch and not converted later on as Angkor wat was. Here we have tried to compare all three but in this fashion:

- 1. We compare Paharpur(Sompura) with Angkor
- 2. We compare Paharpur with Borobudur
- 3. Angkor and Borobudur are compared briefly here and in details in another paper:

Comparative analysis of the architecture of the 2 ancient giant monuments of Indonesia by the authors

Angkor a Hindu temple later converted to Buddhist Temple by addition of a few statutes but basically remaining as a Hindu temple *in toto*. In the 12th century, King Suryavarman II of the Khmer Empire began work on a 500-acre (200 hectare) temple in the capital city of Angkor, in what is now Cambodia. The complex was built to honor the Hindu god Vishnu, but 14th-century leaders converted the site into a Buddhist temple.

Borobudur is the largest Buddhist temple in the world, and ranks with Bagan in Myanmar and Angkor Wat in Cambodia as one of the great archeological sites of Southeast Asia. Borobudur remains popular for pilgrimage, with Buddhists in Indonesia celebrating Vesak Day at the monument.

It was constructed about 778–850 ce under the Shailendra dynasty and has three major levels representing individual stages toward perfection. The first written records concerning Java are from 732 CE. In that year, a Hindu noble, Sanjaya, established a kingdom called Mataram (or Medang) on the Kedu Plain. In 775 CE his kingdom began construction on a monument to commemorate the introduction of Hinduism to Java. A plateau created by the confluence of the Progo River and its tributaries provided the temple's site.

Ten years later this Hindu kingdom was replaced by the Buddhist Sailendra dynasty, vassals to the Srivijaya Empire. Accordingly, they shifted the religious focus of the temple from Hinduism to Buddhism. It took 50 more years to complete this architectural monument – called Borobudur.

The **Pala Empire** was an imperial power during the post-classical period in the Indian subcontinent, which originated in the Varendra region of Bengal (modern day northern Bangladesh). It is named after its ruling dynasty, whose rulers bore names ending with the suffix *Pala* ("protector" in Sanskrit). They were followers of the Mahayana and Tantric schools of Buddhism. The empire was founded with the election of Gopala as the emperor of Gauda in 750 CE. The Pala stronghold was located in Bengal and Bihar, which included the cities Vikrampura, Pataliputra, Monghyr, Somapura, Ramvati ,Tamralipta and Jaggadala.

The Palas were astute diplomats and military conquerors.

Their army was noted for its vast war elephant corps. Their navy performed both mercantile and defensive roles in the Bay of Bengal. They built grand temples and monasteries, including the Somapura Mahavihara, and patronised the great universities of Nalanda and Vikramashila. The Proto-Bengali

language developed under Pala rule. The empire enjoyed relations with the Srivijaya Empire, the Tibetan Empire and the Arab Abbasid Caliphate. Abbasid coinage found in Pala archaeological sites, as well as records of Arab historians, point to flourishing mercantile and intellectual contacts. The House of Wisdom in Baghdad absorbed the mathematical and astronomical achievements of Indian civilisation during this period.

At its height in the early 9th century, the Pala Empire was the dominant power in the northern Indian subcontinent, with its territory stretching across the Gangetic plain to include parts of modern-day eastern Pakistan, northern and northeastern India, Nepal and Bangladesh. The empire reached its peak under Emperors Dharmapala and Devapala.

The Palas also exerted a strong cultural influence under Atisa in Tibet, as well as in Southeast Asia. Pala control of North India was ultimately ephemeral, as they struggled with the Gurjara-Pratiharas and the Rashtrakutas for the control of Kannauj and were defeated. After a short lived decline, Emperor Mahipala I defended imperial bastions in Bengal and Bihar against South Indian Chola invasions. Emperor Ramapala was the last strong Pala ruler, who gained control of Kamarupa and Kalinga. The empire was considerably weakened by the 11th century, with many areas engulfed in rebellion.

The resurgent Hindu Sena dynasty dethroned the Pala Empire in the 12th century, ending the reign of the last major Buddhist imperial power in the Indian subcontinent. The Pala period is considered one of the golden eras of Bengali history. The Palas brought stability and prosperity to Bengal after centuries of civil war between warring divisions. They advanced the achievements of previous Bengali civilisations and created outstanding works of arts and architecture. They laid the basis for the Bengali language, including its first literary work, the *Charyapada*. The Pala legacy is still reflected in Tibetan Buddhism.

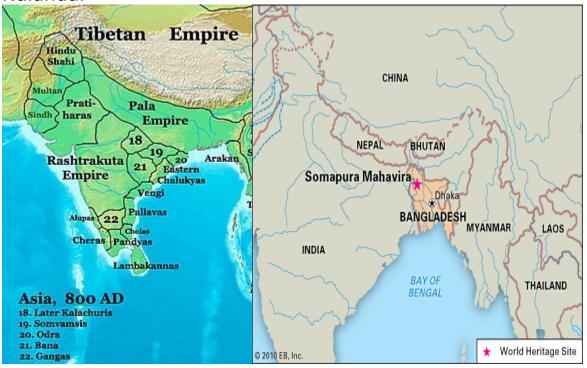
A number of monasteries grew up during the Pāla period in ancient Bengal and Magadha. According to Tibetan sources, five great Mahaviharas stood out: Vikramashila, the premier university of the era; Nalanda, past its prime but still illustrious; Somapura Mahavihara; Odantapurā; and Jaggadala.

	Name of Scholars					
Name of the Regent	RC Majumdar (1971)	AM Chowdhury (1967)	BP Sinha (1977)	DC Sircar (1975-76)	D. K. Ganguly (1994)	
Gopala I	750-770	756-781	755-783	750-775	750-774	
Dharmapal	770-810	781-821	783-820	775-812	774-806	

a					
Devapala	810-c. 850	821-861	820-860	812-850	806-845

The monasteries formed a network; "all of them were under state supervision" and there existed "a system of co-ordination among them ... it seems from the evidence that the different seats of Buddhist learning that functioned in eastern India under the Pāla were regarded together as forming a network, an interlinked group of institutions," and it was common for great scholars to move easily from position to position among them.

Repute: As the rulers of Gautama Buddha's land, the Palas acquired great reputation in the Buddhist world. Balaputradeva, the Sailendra king of Java, sent an ambassador to him, asking for a grant of five villages for the construction of a monastery at Nalanda.



Monastery of Paharpur is described below:

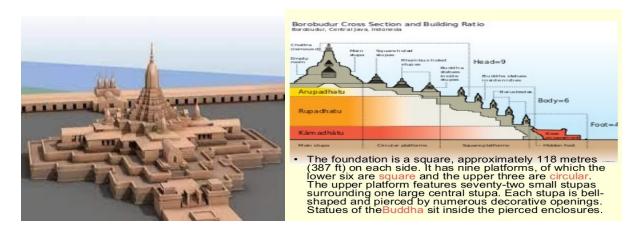
Background: During the lifetime of Buddha, it was relatively simple for followers of his teachings to find answer to their questions. They would just ask him.

Even in the centuries after Buddha's death, there was only a small number of people who were listened to as thought-leaders in the religion. The great Indian emperor Ashoka, for instance, took on a guiding role of shaping the messages of Buddhism as he spread it across the region.



Aerial view

But as Buddhism expanded across Asia to many countries and many cultures to egoist despots and emperors who looked upom themselves as "shinning lights" building gigantic temples and complexes in veneration to Buddha but in fact as an advertisement o themselves and their dynasty; Buddhist ideas fractured quite dramatically. There were different ways of interpreting the Buddhist texts – and there were also new texts being written. Followe rs in different countries adapted the faith to their own circumstances. Even within the same region, the methods for practicing the faith evolved in a variety of ways.



ED Model of Paharpur to right Borobodur cross section to left

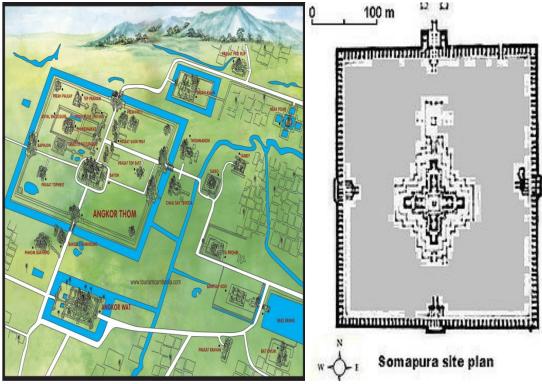
It was against this backdrop that the great monastery of Paharpur was established in the 8th century in modern-day Bangladesh. Here, the brightest minds of the era gathered to try to answer the questions that arose from this fractured Buddhist landscape. Paharpur served as one of the most important intellectual centres in the world until the 12th century, and the philosophies that emerged were a synthesis of generations of different ideas.

With such a concentration of scholars, Paharpur played a vital role in the rise of a new branch of Buddhism called Vajrayana, that would spread through Asia and is still the dominant form practiced in Tibet. In particular, the philosophies being discussed at Paharpur were easily taken to Southeast Asia along a new maritime trade route. You can still see the influences in some of the region's monuments, such as Borobudur (Indonesia), Bagan (Myanmar), and Angkor Wat (Cambodia), that are all based on Paharpur's main temple.

The vast monastery at Paharpur was only possible because of the support of the wealthy Pala Dynasty that for 400 years ruled Bengal, the historic region that is now mainly Bangladesh and the Indian state of West Bengal. It was built at the end of the 8th century under King Dharma Pala Deva, the most important of the Pala kings. It was his sponsorship of Buddhism in Bengal that began a revival of the faith in the region.

Similarly it was a dynasty that supported the construction of Angkor as we all know.

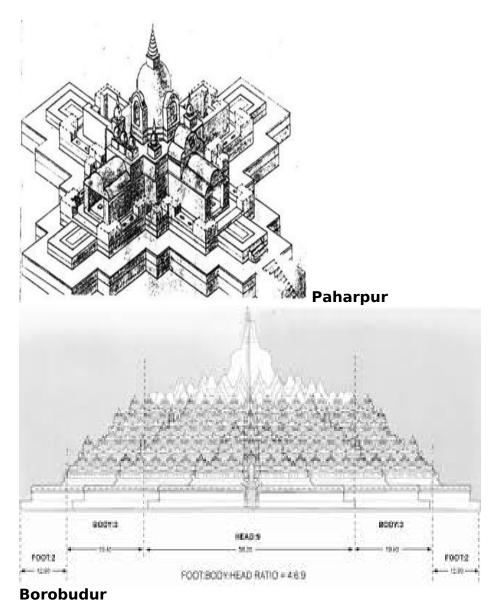
The name Angkor is a corruption of the Sanskrit "Nagara", meaning city or capital while "Vat" is a relatively modern Siamese name, so the name means "City Temple." Angkor Wat The temple was dedicated to the Hindu God Vishnu, by the fall of the empire in 15th century, the site had become a Buddhist shrine. Angkor Wat is partly protected from its most lethal destroyer, water, by a network of hidden drains emplaced in the 1960's by the French scholar and former conservator Bernard Philippe Groslier and his staff of 1000.



Angkor Wat (Plan above left) is considered to be the largest and most impressive stone temple in existence. This magnificent architectural composition was the conception of King Suryavarman II. Howvever it completed during the reign of King Dharanindravarman II.

The epic symmetries of Angkor Vat begin with the outer gallery that runs in a circumference of half a mile. Within the

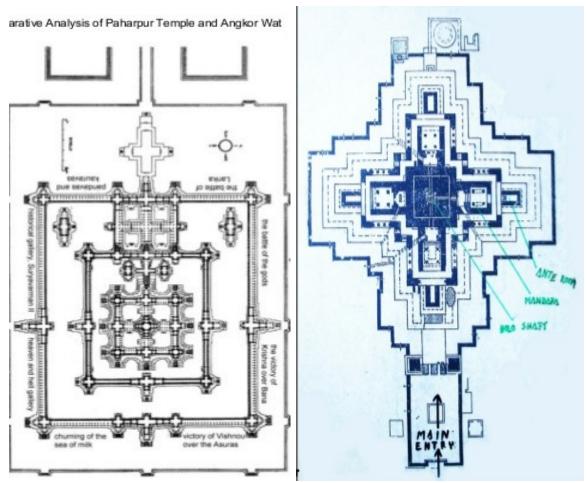
gallery sculptures in bas-relief unfold narratives from the myths of Vishnu, Krishna and Rama. One section of gallery top left that sheltered the depiction of a Hindu creation myth was removed for restoration. The stones were catalogued and neatly laid out in the grassy area beyond.



Although the plan, form and symbols differ, Angkor Vat is cathedral-like in its harmonious mix of small details and massive architecture. Plan consists concentric rectangles. Orderly and balanced. Logically symmetrical.

Principal approach is from the west. Why the main gateway, flanked by libraries at right, faces west is unclear. The other temples face east, away from the direction of the dead. Partly to bring it into alignment with the royal city.

Façade consists of elaborate storied structure breaking the long lines of arcaded enclosure. Gateway interiors of the portico resolves itself into a square plan of pillared halls with two diametrical corridors.



Angkor(Left) Paharput (Right)

Entire scheme was laid out in 650 ft water moat. Broad square in plan. Total length of 24 miles. Communication across the water barrier was by a bridge on western side and approached by a pave of 36/1500 ft. Stone platform on which it stands is square in plan. Water Moat Stairway continuing the axial line of the portico ascends to the second terrace. At each angle of

the terrace, the inner space of which is a square of 130 ft side is a Sikhara.

Comparative Analysis of Paharpur Temple and Angkor Wat

According to the Bengali Vocabulatory, the name Paharpur (Pahar = hill, pur = locality) means a locality of hill. World-famous Angkor Wat temple of Cambodia was inspired by this Somapura Mahavihara Paharpur

Somapura Mahavihara in Paharpur, is among the best known Buddhist Viharas in the Indian Subcontinent and is one of the most important archeological sites in the country. Somapura Mahavihara, an ancient Buddhist monastry was built between 700-800 A.D during the reign of a Buddhist empire

Entrance in Paharpur is from north and east whereas in Angkor Wat it is from the west.

Sikhara of Angkor Wat ws terraced where as in Paharpur it could have been terraced but it is still unknown.

Materials: Paharpur was of brick and Angkor Wat was of stone.

Age: Paharpur monastery is much older than those and more importantly Buddhism spread to south-east asia via bengal, so is the architecture and its not the whole monastery, only it's ruins.

Size: The 3d image of assumed Paharpur compared with Angkor Wat could have been like this- Paharpur complex is similar but much smaller in scale to Angkor Wat. The basic idea is the same, massive central stupa surrounded by smaller and more and more numerous stupas.

BasReliefs: Some other diffrences we get are -Bas reliefs speak of Hindu God Vishnu in Angkor Wat and in Paharpur it speaks of more or less Buddhist culture. Comparative Analysis.

Moat: Angkor wat has a huge water moat for protection whereas Paharpur does not have it. **Lake:** During rain, the excavated place becomes a lake, completely placing the lower areas of the underground room wall together with their unique rock and clay relieves, resulting in damage by the activity of salt and dangerous plants growth, while water increasing by capillary activity impacts the higher areas.

Paharpur Courtyard: Within the walls is a courtyard containing the remains of a traditional Buddhist stupa. Each side of the monastery measures some 900 feet (270 metres) in length and is composed of monks' cells. The courtyard around the central shrine is dotted with several units of straggling structural ruins. Of them, Panchavede, a group of five votive stupas. Each worshipping point, excepting the southern one, has a staircase connection with the monastery courtyard in front. The monastery is square in plan, being 281m on each side. The structure holds more than 170 such cells and 92 altars of worship. Two entrance provisions on the north and one in the east.



Built by King Dharma Pāla Deva (770-800 AD), second king of the Pāla Dynasty, in the late 8th century AD, the monastery follows a layout perfectly adapted to its religious function. - © Matyas Rehak / Shutterstock

Temple plan of Paharpur

The central shrine of the main temple of Paharpur rises up from the centre of the site as a physical manifestation of the new Buddhist ideas developed here. It was the first time a cross shape was used for the design of a Buddhist temple and it's still an impressive sight for visitors. Around the edges of the central quadrangle are the four long walls that make up the monastery, each with dozens of rooms that monks would have lived in. With simple harmonious lines and a profusion of carved terracotta plaque decoration, the monastery represents one of the greatest artistic achievements of its time. It is a terraced structure springing from a cruciform ground plan and expanding from a mid-pile of square configuration. The unflustered wall surfaces of the lower two terraces are decorated with friezes containing terracotta plaques showing different scenes.

Evidence of other sacred objects and shrines is found throughout. Through the 17th century it was occupied important intellectual centre that was alternately by Buddhists, Jains, and Hindus. Clues to its various inhabitants are found on artwork contained within the Somapura Mahavira's thick outer walls; including the Jaina chaturmukhar structure, which displays the artistic and religious influences of the monastery's three main residential groups: images of Jaina deities abound on its main walls, and Buddhist terra-cotta artwork and sacred Hindu sculptures are found on its base walls.

At the time, the monastery was known as Somapura Mahavihara. It was connected academically with other major monasteries that thrived with the support of the Pala Dynasty, including Vikramashila and Nalanda (another World Heritage Site) in the Bihar of India. Scholars were able to move between the institutions, amplifying the intellectual pursuits of the monks.

An intellectual life

In the long walls that make up the central quadrangle at Paharpur are the rooms where the monks would have lived. There are 177 of them and historians assume that there would be multiple people in each one.

Life in the monastery was very formal and structured. The monks would wake up at sunrise and walk around the main temple two or three times on all three tiers, before beginning their academic day by studying the scriptures. After lunch, they would usually spend the afternoon in meditation. At sunset, the monks would walk around the temple again.



Some of the 177 rooms where the monks would have lived around the courtyard of the monastery of Somapura Mahavihara at Paharpur. - © Julfiker Ahmed

Even though Paharpur was a centre of learning, it did not have classrooms in the way we might think of them today. Instead, there was an emphasis on self-learning and the monks would use the space in their rooms to read texts or think about issues.

Many of the monks and academics who would stay at the monastery were not permanent residents. Some would come for just a few days or weeks. It was a chance for them to be alone in their thoughts in a spiritual environment or seek guidance from other scholars. For this reason, the monastery was intentionally separated from local communities to prevent distractions.

The rise of Vajrayana

By the time Paharpur was established, there were two main branches of Buddhism - Mahayana and Theravada. However, a third branch was beginning to develop around Bengal. It was called Vajrayana and it was at monasteries like Paharpur that monks meditated on this new form of Buddhism and it evolved into a philosophy that was then spread through Asia. Vajrayana is based on Mahayana principles that all beings are suffering and an individual should try to reach enlightenment to help everyone, not just themselves. However, the main difference is that Vajrayana says people can reach enlightenment much faster and begin to make a difference almost immediately. Followers of Vajrayana believe that by doing certain rituals and looking at the world in a more complex way, they can achieve in one lifetime what other Buddhists may take hundreds or thousands of lifetimes to do.

Although the philosophies of Vajrayana did reach many parts of Asia, there are not many countries where it is still practiced in large numbers. A form of it is still found in Shingon Buddhism in Japan and in Tendai Buddhism in China. However, Vajrayana is still the dominant Buddhist philosophy in Tibet, Mongolia, northern India, and parts of Nepal.

Architectural influence

Aside from the spread of Vajrayana, the biggest influence of Paharpur can be seen in the architecture of some of the greatest monuments in Southeast Asia.

The main temple of Paharpur was among the first temples with a cross-shaped main design. This cruciform is believed to be a representation of the five 'Eternal Buddhas' that are a part of some Buddhist philosophies, particularly in the Vajrayana branch. The temple is built as a series of three terraces, with the lower two and middle terrace including a path that you can use to walk around the structure. The upper level is a massive rectangular central block.





Ruins of north entry gate of Somapura Mahavihara - © Julfiker Ahmed It's these design elements that were then exported to Southeast Asia along a new trade route that the Pala Dynasty had established, reaching all the way down to Java. When Buddhists in Southeast Asia went to construct their most important temples, they took their inspiration from the great learning centre of Paharpur. Today, you can see the terraced cruciform design at Borobudur in Indonesia, Angkor Wat in Cambodia, and Bagan in Myanmar.

Layout: Each side of the monastery measures some 900 feet (270 metres) in length and is composed of monks' cells; the structure holds more than 170 such cells and 92 altars of worship. Within the walls is a courtyard containing the remains of a traditional Buddhist stupa. Evidence of other sacred objects and shrines is found throughout, includina the Jain chaturmukhar structure, which displays the artistic religious influences of the monastery's three main residential groups: images of Jain deities abound on its main walls, and Buddhist terra-cotta artwork and sacred Hindu sculptures are found on its base walls.

UNESCO LIST ON PAHARPUR(edited to suit text) In https://whc.unesco.org/en/list/322/ UNESCO Write Up on architecture as far away as Cambodia.

Brief synthesis

The first builder of the monastery was Dharmapala Vikramshila (770-810AD), the king of Varendri-Magadha, as inscribed on a clay seal discovered in the monastery compound. The plan of the monastery can be described as a large square quadrangle measuring approximately 920 feet, with the main entrance, an elaborate structure, on the northern side. The outer walls of the monastery are formed by rows of cells that face inwards toward the main shrine in the centre of the courtyard. In the last building phases of the Monastery these cells, which formed the outer wall, totalled 177.

The main central shrine has a cruciform ground plan and a terraced superstructure that rises in three terraces above ground level to a height of about 70 feet. The upper level is a massive rectangular central block which forms the central brick shaft. The intermediate terrace is a wide circumambulatory path which passes four main chapels or *mandapas* architectural plan, it is in fact a simple cruciform that has been elaborated with a series of projections at the re-entrants, a form that is copied at all levels on the main shrine. At the intermediate level there were originally two bands of terracotta plaques running around the full perimeter of the shrine, out of which half are still preserved in situ.

The level 3 the ground today is feet above original *pradakshinapatha* or main circumambulatory path. below the base of the lowest band of terracotta plagues. Archaeological excavations have revealed a 15 feet pathway that follows an elaborated cruciform shape, a feature that can be discerned from the foundations of the outer wall that enclose the pathway and that still exist. At the base of the shrine, there are over 60 stone sculptures which depict a variety of Hindu divinities. The main entrance to the monastery was through a fortified gate on the northern access to the central temple. The majority of the ancillary buildings, such as the kitchen and the refectory, are located in the south-east corner, but there were also a few structures to be found in the north-east corner.

Epigraphic records testify that the cultural and religious life of this great Vihara, were closely linked with the contemporary Buddhist

centres of fame and history at Bohdgaya and Nalanda, many Buddhist treatises were completed at Paharpur, a centre where the Vajrayana trend of Mahayana Buddhism was practiced.

Today, Paharpur is the most spectacular and magnificent monument in Bangladesh and the second largest single Buddhist monastery on south of the Himalayas.

Criterion (i): This monastery-city represents a unique artistic achievement. The symmetrical layout and massively built single unit of the monastery was perfectly adapted to its religious function. Its simple, harmonious lines and its profusion of carved decoration, in stone and terracotta, are important artistic masterpieces.

Criterion (ii): The striking architectural form introduced at Paharpur on a grand scale for the first time in Asia, profoundly influenced the subsequent construction of temples of Pagan in Myanmar and Loro-Jongrang and Chandi Sewer temples in central Java. It also continued to influence Buddhist architecture as far away as Cambodia. The craftsmanship of Paharpur terracotta still endures since the 8 th century A.D. in the whole of deltaic lands around.

Criterion (vi): Somapura Mahavihara, the Great Monastery evidences the rise of Maharaja Buddhism in Bengal from the 7 th century onwards. It became a renowned centre of Buddhist religion and culture during the royal Patronage of Pala Dynasty and was a renowned intellectual centre until the 17 th century.

Integrity

At present, only the archaeological boundaries have been established at the site, which could be regarded as the boundaries of the property. These boundaries include all required attributes to express its Outstanding Universal Value. However, the potential of mining activities in the vicinity of the property, as noted by the Committee at the time of inscription, highlights the urgency of establishing the boundaries of buffer zone for the property, which would need to take into account the natural environment surrounding the monument to maintain visual relationships between the architecture and the setting. Provisions

for the management of the buffer zone need to be identified and implemented.

Concerning to the material integrity of the property, the still uncovered part of the central shrine, as well as some terracotta plaques, are gradually deteriorating due to environmental element such as salinity and vegetal germination. This constitutes a threat to the physical integrity of the fabric and needs to be attended to.

Materials:

Built with facial brickwork of the walls, which have prioritised presentation. In addition, the introduction of slat laden bricks and mortar as far back as in the conservation works of the 1930's has further aggravated the situation

Protection and management requirements

The whole complex, perimeter along with lofty central shrine, lies within an area protected by the government and supervised regularly by the local office. National legislation includes the Antiquities Act (1968, amended ordinance in 1976), Immovable Antiquities Preservation Rules, the Conservation Manual (1922) and the Archaeological Works Code (1938).

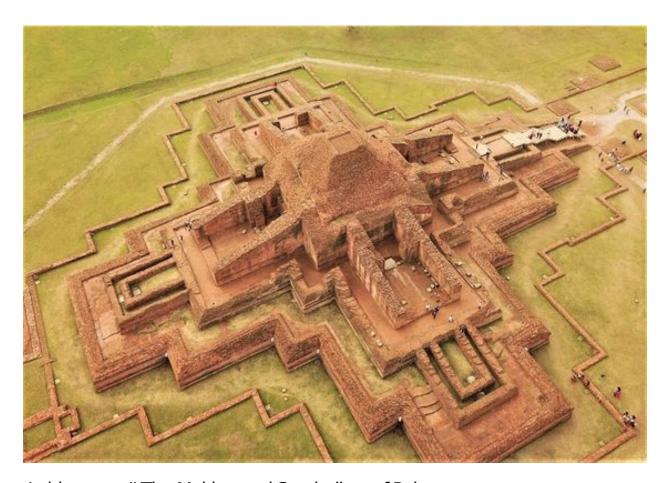
Apart from Bali, **Borobudur** is the most well-known cultural site of Indonesia, its iconic image is widely used to represent Buddhism or exotic of Southeast Asia which turned Borobudur to be a must see place in this country besides another interesting place in Central Java. Borobudur was built in 9th century under the reign of dynasty Sailendra and located in Magelang, Central Java. It has nine platform, the lower part contains with six square and the upper three are circular. It has approximately 72 small stupas and one large in the central of the stupa. It also has the statue of Buddha sits inside the big stupa. Borobudur has 2.672 relief that carved into its wall. The architecture of Borobudur mostly tells about the story of human being which tell about the symbol of the Buddhist universe as well known as Kamadhatu, Rupadhatu, and Arupadhatu.

The relief of Kamadhatu represents the human's life, it describes the behaviour that still get along with the lust. It can clearly be seen right on the low wall of the temple.

The relief of Rupadhatu represents the willingness to leave behind everything about life, and the last relief was named as Arupadhatu, it's only surrounded by the statues, it also represents that human are no longer attach with anything in life, they are free from lust and ready to reach Nirvana. Built with about 2,000,000 cubic feet (56,600 cubic metres) of gray volcanic stone. Borobudur is a unique temple located in an elevated area between two twin volcanoes and two rivers. Enormous amount of stones, used in the construction of Borobudur were taken from neighboring rivers. The stone was cut to size, transported to the site and laid without mortar. Borobudur encloses a small hill and is shaped like a stepped pyramid with three major levels—a square base, a middle level of five square terraces, and an upper level of three circular terraces—totaling, in effect, nine lesser sections. Instead of being built on a flat surface it is built on a natural hill. However, construction technique is similar to other temples in Java.

Literature Review:

Ruins of the Buddhist Vihara at Paharpur – Bangladesh point to the evidence of the rise of Mahayana Buddhism in Bengal from the 7th century onwards, Somapura Mahavira, or the Great Monastery, was a renowned intellectual centre until the 12th century. Its layout perfectly adapted to its religious function, this monastery-city represents a unique artistic achievement. With its simple, harmonious lines and its profusion of carved decoration, it influenced Buddhist architecture as far away as Cambodia.



In his paper "The Making and Symbolism of Paharpur Mahavihara, Faruque Hasan, states that the guru of the Shylendra king, who built Borobudur, was a Bengali monk. The Buddhist Shylendra Dynasty of East Asia was of South Indian origin. The Shylendra kings had close relationship with the Buddhist Pāla rulers of Bengal and Magadha. So here comes the parallel between the Borobudur and its Indian Counterpart at Paharpur. In spite of all this it is possible that Paharpur was so famous that its repute reached the kings who built Borbodur and was a source of spiritaual as well as dimensional inspiration.

http://paharpurmahavihara.blogspot.com/2010/02/making-and-symbolism-of-paharpur.html.

Tanzila Samad Choudhury Dept. of Architecture, Ahsanullah University of Science and Technology, Bangladesh holds that reclaiming the Lost Architectural Heritage Sompur Mahavihara: Through Conjectural Restoration is important in the archaeological history of Bengal, and the central shrine and the monastery looked carries the morphological evaluation from the

previous temples mirroring development from previous examples of the Buddhist monasteries.

http://www.aj.arch.chul



a.ac.th/nakhara/

files/article/191-419-1-PB.pdf

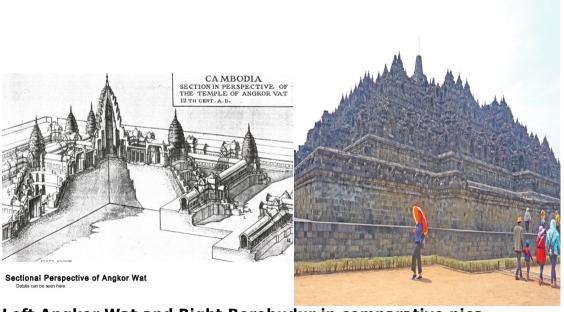
Paharpur



Borobudur



Fish eye lens at Paharpur shows the main vihara. Compare it with pic above of Borobudur also showing main Vihara



Left Angkor Wat and Right Borobudur in comparative pics





Central stupa at the top of Borobudur in 1907-1931 On RIGHT (TODAY) Sompura or Paharpur Below



	Borobudur	Paharpur	Angkor wat
Nature	Monastry only part of the Stupa	Hostel and House of Wisdom	• .
Built by	Royal Decree	Royal Decree	Royal Decree
Scale	Gigantic	Moderately big	Gigantic
Moat	No	No	Yes
Lake	No	Yes	No

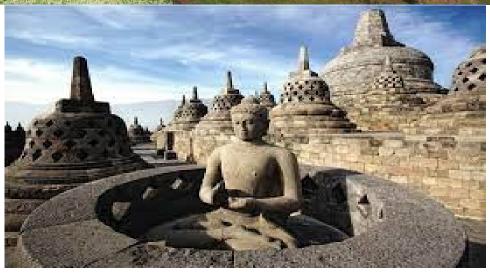
Outer walls	Yes	No	Yes	
Materials	Stone- Andesite	Mud bricks	Latrice(stone)	
		Stone statutes found		
Rooms	No but Halls of	177	Halls	
	Worship			
Storeis	Yes 4	3	Yes 4	
Monastery	No	Yes	Temple	
Outside	Yes-complex	Yes definite	Temple city	
structures	-		-	
Bathing ghat	Not found	yes	No info	
Area	2500 Sq Mt.	measures 900 feet	163 Hectares (24 km) east to west	
		(270 metres) length	(8.0 km) north to south	
SATUPA	Yes	Yes	No	
Jain & Hindu	No	yes	Yes	
statutes				
Rectangle	Round mandala	Square mandala	Yes-concentric	
Architecture	mix of Javanese style	Pala Dynasty	Hindu& Buddhist	
	and Gupta		Cosmology ANGKORIAN	
Location	dynasty architecture Indonesia	Bangladesh	Cambodia	
National symbol	No	No	Yes	
Lake	Within a now	No plains	Plains	
Lake	extinct lake	NO planis	riaiiis	
Abandonment	No	Not really	Yes	
Rediscovery	Yes	No	YES	
Restoration	Yes	No	Yes	
Contemporary	Yes	No	Yes	
events				
Design	Single Stupa	comples	Temple city	
Reliefs	Yes	No	Yes	
The law of	Yes	No	No	
karma				
(Karmavibhangg				
a)				
Sudhana's search	Yes	No	No	
for the ultimate				
truth (Gandavyuha) Buddha Statutes	Yes	Yes	Yes-Placed later	
Dudulla Statutes	163	163	on	
The birth of Buddha	Yes	No	statues of	
(Lalitavistara)			Buddhas and	
			Devas	
(Jataka &	Yes	no	statues of	
Avadana) tales			Buddhas and Devas	
Legacy	Yes	Yes	Yes	
Gallary	Yes	No	Yes	
Galiai y	163	140	163	

Tourism	Yes	Yes	Yes
Construction techniques	t 2,000,000 cubic feet (56,600 cubic metres) of gray volcanic stone		5 to 10 million sandstone block
Form	cruciform ground plan	Cruciform ground plan. Rectangular central block	Square with circle within
Terrace	Yes 3	Yes 3	Yes 4
unique artistic achievement.	yes	yes	yes
City	Yes	yes	yes
Amazing	Yes	Yes	Yes
Carvings	The walls and balustrades decorat ed with fine surface area of 2,500 m ² .		all surfaces, columns, lintels, even roofs carved
Stupas	72 openwork stupas, each containing a statue of the Buddha.	177 rooms	No Stupa -72 major temples
Pedestals	504 buddha statutes	ornamental pedestals built in as many as 92 rooms.	1400 temples surrounding Angkor all contain pedestals









CHAPTER VII





nārāyaṇaṁ namaskṛtya naraṁ caiva narottamam devīṁ sarasvatīṁ vyāsaṁ tato jayam udīrayet

What is the significance of the Gopuram?

Gopuram"

It is believed that construction of temples started in Kaliyug. In the earlier Satya Yuga, Treta Yuga and Dwapar Yuga, the devotees were able to make direct union with God.

Meaning of Go Puram

- 1. Tamil language terms like 'ko' 'koil' in Tamil makes us wonder whether the word gopuram was originally pronounced as 'kopuram' but transformed into 'gopuram' as the word came to symbolise the temple gopuram in sanskrit. The word 'ko' in Tamil stands for king and also God. In early works, ko+il (koil) was meant for the king's palace and it came to signify temple only much later. Similarly, ko+puram might have meant the outer portion of the king's / god's dwelling.
- 2. Another interesting theory:
- "gopuram" comes from "go puram" where "gO" probably refers to cows or cow-shed, "gO shAla", and "puram" means "city", "neighbourhood" or "residence".
- 3. In ancient days, temples in India did have separate quarters inside the temple precincts to house many cow-sheds. Often these cowsheds were built abutting the temple tower (as can be seen even now in the Kanchi Varadaraja temple), giving hence the temple-tower its unique name of "gO puram" the "residence of cows".
- 4. The very soil inside a temple is said to be supremely sacrosanct. We should ask ourselves why it is so. If there are indeed any "gO shAla-s" within a temple and the herds are often led about, here and there, within the precincts, then the soil they trample upon is said to become "gO dhULi" -- the dust thrown up by cow-hoofs. This fine dust blown off the hoofs of cows is held to be sacred since in the 'Krisha-avatar. Now, whenever a pilgrim in India enters into the portals or the "gOpuram" of any temple, he is expected

to mentally re-live the scenes of the "krishnAvatAra" and imagine too, as well, the "gO dhULi" spread fine all across the cowherd, Krishna's person.

The tower that guards the sacred, "sAttvic" soil of "gO dhULi" strewn and spread all across the temple grounds -- such a tower, quite appropriately, gets the name "gO puram".

Gopura Darshan in Temples

5. As soon as we enter into the temple (or even before entering) we should do pranams (Namaskarams) to the Gopuram.

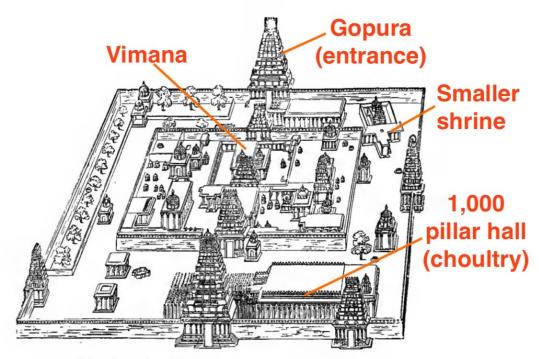
In fact those who are in a hurry and who do not have time to enter into a temple will have the blessing of the almighty just by doing worship to the Gopuram. But some people take it for granted that it is just enough if they worship the Gopuram and they need not even enter into the temple.

6. What is the significance of the Gopuram?

Our scriptures confirm that the Gopuram is nothing but the symbol of the feet of God! When we have the darshan of the feet of God- what else do we need?

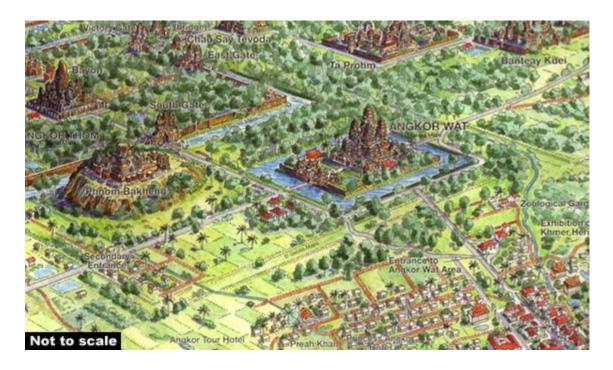
A gopuram or gopura is a monumental tower, usually ornate, at the entrance of any temple, especially in Southern India. They are a prominent feature of koils, Hindu temples built in the Dravidian style. Murdeshwara Temple in Karnataka,India has 2 Gopurams, but most temples have just 1. This Gopuram is 237 feet tall and the temple is from 2000 BC.Yes.

If it is a complex(See Pic Above) of several temples such as the Angkor, then each structure should generally have 1. With the increasing threat from invading armies, the temple cities found it expedient to erect a series of protective walls to safeguard and defend their temples, palaces and cities. The Gopuras constructed on the gateways leading from one enclosure to the next, initially, served as watch towers for defense. The gopuram's origins can be traced back to early structures of the Pallava kings, and relate to the central shikhara towers of North India. Most Kalasams are made of metal and some of stone. View of Gopuram (temple tower) is one of the important rituals of Hindu worship along with view of Dwajasthambam or Kodimaram (temple flag mast). These Gopurams were topped with ornamental Kalasams.



Temple at Tiruvallûr (from Râm Râz's Essay on the Architecture of the Hindus).

Gopurams are widespread in south Indian temples, predominantly in Tamil Nadu. Very tall gopurams are a later feature, added from the Middle Ages onwards, typically to much older temples.



Birds eye view from the Western Baray Lake to Wat Bakong, Lolei and Phnum Bok.From this Pic the tall GOPURAMS are easily seen



History of Temples

In the Vedic period, there were no temples. The main object of worship was the fire that stood for God. This holy fire was lit on a platform in the open air under the sky, and oblations were offered to the fire. It is not certain when exactly the Indo-Aryans first started building temples for worship. The scheme of building temples was perhaps a concomitant of the idea of idol worship. Locations of Temples

As the race progressed, temples became important because they served as a sacred meeting place for the community to congregate and revitalize their spiritual energies. Large temples were usually built at picturesque places, especially on river banks, on top of hills, and on the seashore. Smaller temples or open-air shrines can crop up just about anywhere - by the roadside or even under the tree.

Holy places in India are famous for its temples. Indian towns — from Amarnath to Ayodha, Brindavan to Banaras, Kanchipuram to Kanya Kumari — are all known for their wonderful temples.

Temple Architecture

The architecture of Hindu temples evolved over a period of more than 2,000 years and there is a great variety in this architecture. Hindu temples are of different shapes and sizes — rectangular, octagonal, semicircular — with different types of domes and gates. Temples in southern India have a

different style than those in northern India. Although the architecture of Hindu temples is varied, they mainly have many things in common.

The 6 Parts of a Hindu Temple

- **1. The Dome and Steeple:** The steeple of the dome is called 'shikhara' (summit) that represents the mythological 'Meru' or the highest mountain peak. The shape of the dome varies from region to region and the steeple is often in the form of the trident of Shiva.
- **2. The Inner Chamber:** The inner chamber of the temple called 'garbhagriha' or 'womb-chamber' is where the image or idol of the deity ('murti') is placed. In most temples, the visitors cannot enter the garbhagriha, and only the temple priests are allowed inside.
- **3.** The Temple Hall: Most large temples have a hall meant for the audience to sit. This is also called the 'nata-mandira' (hall for temple-dancing) where, in days of yore, women dancers or 'devadasis' used to perform dance rituals. Devotees use the hall to sit, meditate, pray, chant or watch the priests perform the rituals. The hall is usually decorated with paintings of gods and goddesses.
- **4. The Front Porch:** This area of the temples usually has a big metallic bell that hangs from the ceiling. Devotees entering and leaving the porch ring this bell to declare their arrival and departure.
- **5. The Reservoir:** If the temple is not in the vicinity of a natural water body, a reservoir of fresh water is built on the temple premises. The water is used for rituals as well as to keep the temple floor clean or even for a ritual bath before entering the holy abode.
- **6. The Walkway:** Most temples have a walkway around the walls of the inner chamber for circum-ambulation by devotees around the deity as a mark of respect to the temples god or goddess.

Ra nk	Temple	lmage	Hei ght ft	Consec ration Year	Location
1	Ranganathaswamy Temple, Raja Gopuram		239.5 01	1987 CE	Srirangam, Tiruchirappalli, Ta mil Nadu, India

Ra nk	Temple	lmage	Hei ght ft	Consec ration Year	Location
2	Murdeshwara Temple		237	2008 CE	Murdeshwar, Karna taka, India
3	Annamalaiyar Temple East Gopuram (Raja Gopuram)		216.5	9th century CE; gopuram 16th century	Tiruvannamalai, Ta mil Nadu, India

Ra nk	Temple	Image	Hei ght ft	Consec ration Year	Location
4	Srivilliputhur Andal Temple		193.5	10th-16th centuries CE	Srivilliputhur, Tamil Nadu, India
5	Ulagalantha Perumal Temple		192	CE	Tirukoilur, Tamil Nadu, India

Ra nk	Temple	Image	Hei ght ft	Consec ration Year	Location
6	Ekambareswarar Temple		190	CE	Kanchipuram, Tami I Nadu, India
7	Kallazhagar Temple		187	CE	Madurai, Tamil Nadu, India
8	Kasi Viswanathar temple, Tenkasi		180	15th century CE	Tenkasi, Tamil Nadu, India

Ra nk	Temple	lmage	Hei ght ft	Consec ration Year	Location
8	Annamalaiyar Temple Northern Gopuram (Ammani Amman Gopuram)		171	9th century CE	Tiruvannamalai, Ta mil Nadu, India
9	Meenakshi Amman Temple		170	870 CE	Madurai, Tamil Nadu, India
10	Virupaksha Temple, main entrance gopuram		166	15th century CE	Hampi, Karnataka, India
11	Sarangapani Temple		164	12th century CE	Kumbakonam, Tam il Nadu, India

Ra nk	Temple	Image	Hei ght ft	Consec ration Year	Location
12	Annamalaiyar Temple Southern Gopuram (Tirumanjana Gopuram)		157	9th century CE	Tiruvannamalai, Ta mil Nadu, India
13	Rajagopalaswamy Temple		154	1523- 1575 CE	Mannargudi, Tamil Nadu, India

Ra nk	Temple	lmage	Hei ght ft	Consec ration Year	Location
14	Lakshmi Narasimha Temple, Mangalagiri		153	1809 CE	Mangalagiri, Andhr a Pradesh, India
15	Annamalaiyar Temple Northern Gopuram (Pei Gopuram)		144	9th century CE	Tiruvannamalai, Ta mil Nadu, India

Ra nk	Temple	lmage	Hei ght ft	Consec ration Year	Location
16	Ranganathaswamy Temple, Vellayi Gopuram		144	13th Century CE ¹	Srirangam, Tamil Nadu, India
17	Sankara Narayanan Temple, Sankaranayinarkoi I, Sankarankovil		127	11th century CE	Sankarankovil, Tam il Nadu, India
18	Nanjundeshwara Temple		120	9th century CE	Nanjangud, Karnat aka, India

Significance of the "Gopuram" in Hindu temples?

All Indian temples (12th century onwards) were surrounded by series of concentric protective walls called the prakaras. Towers erected over the entrance gateways of these walls are known as Gopuras or Gopurams. These towers can go over fifty meters tall.

A Gopura is generally constructed with a massive stone base and a superstructure of brick and pilaster. It is rectangular in plan and topped by a barrel-vault roof crowned with a row of finials. It differs from the Vimana over the central shrine in that it need not necessarily be square-based.

When viewed from top, the Gopura too resembles a Mandala; With sculptures and carvings of Yalis and mythical animals located in the outer enclosure. Humans and divine beings are in the inner enclosures. The peak of the Gopura, the Kalasha, is at the centre of the Mandala



These sculptures follow a variety of themes derived from the Hindu mythology, particularly those associated with the presiding deity of the temple where the gopuram is located.

Symbolically, the Gopura or the entrance to the temple represent he feet of the deity. A devotes bows at the feet of the Lord at the entrance as he steps into the temple and proceeds towards the sanctum, leaving behind the world of contradictions. It is believed that construction of temples started in Kaliyug. In the earlier Satya Yuga, Treta Yuga and Dwapar Yuga, the devotees were able to make direct union with God.

Meaning of Go- Puram

In sanatana Sampradaya All Temples have a GOIPURAM or Sikharam on the sanctum sanctorum or Garbha gudi where MOOLA VIRAAT is there. If One is unable to enter into Temple and Have Darshan of eswara or Parameswari there, the Shastraas say that have a DARSHAN OF THE GOPURAM. On the Gopuram there will be a small Moorthy of moola Vit\raat. This is Called VIMAANA MOORTHY.

it is equal to the Moola Viraat in the Garbha Gudi.

So those who could not have an opportunity to have a darshan inside the Garbha Gudi, for reasons of RUSH OR HEALTH OR ANY OTHER THING, they CAN SEE THIS VIMAANAM OR AALAYA SIKHARAM AND IT IS EQUAL TO ENTERING AND HAVING DARSHAN INSIDE.

This Vimaana or GOPURA DARSHANAM IS SO PAAPA VIMOCHANAM as you are are we are seeing the Parameswara in GOPURA. That is the meaning.

Tamil terms like 'ko' 'koil' in Tamil makes us wonder whether the word gopuram was originally pronounced as 'kopuram' but transformed into 'gopuram' as the word came to symbolise the temple gopuram in sanskrit. The word 'ko' in Tamil stands for king and also God. In early works, ko+il

(koil) was meant for the king's palace and it came to signify temple only much later. Similarly, ko+puram might have meant the outer portion of the king's / god's dwelling

Another interesting theory:

"gopuram" comes from "go puram" where "gO" probably refers to cows or cowshed, "gO shAla", and "puram" means "city", "neighbourhood" or "residence". In ancient days, temples in India did have separate quarters inside the temple precincts to house many cow-sheds. Often these cowsheds were built abutting the temple tower (as can be seen even now in the Kanchi Varadaraja temple), giving hence the temple-tower its unique name of "gO puram" - the "residence of cows".

Origins: The Gopuram's origins can be traced back to early structures of the Tamil kings Pallavas; and by the twelfth century, under the Pandyarulers, these gateways became a dominant feature of a temple's outer appearance, eventually overshadowing the inner sanctuary which became obscured from view by the Gopuram's colossal size. It also dominated the inner sanctum in amount of ornamentation. Often a shrine has more than one Gopuram. They also appear in architecture outside India, especially Khmer architecture, as at Angkor Wat.

A koil may have multiple Gopurams, typically constructed into multiple walls in tiers around the main shrine. The temple's walls are typically square with the outer most wall having gopuras. The sanctum sanctorum and its towering roof (the central deity's shrine) is also called the Vimanam.

Seeing Gopura is as good as seeing God and therefore if one sees God, papa vimochana is done. Elders say that Morning Gopura Darshan is punniyam.

Visual Context of the GOPURA DHARSHAN IN TEMPLES ;-

As soon as we enter into the temple (or even before entering) we should do pranams (Namaskarams) to the Gopuram.

In fact those who are in a hurry and who do not have time to enter into a temple will have the blessing of the almighty just by doing worship to the Gopuram. But some people take it for granted that it is just enough if they worship the Gopuram and they need not even enter into the temple.

What is the significance of the Gopuram?

Our scriptures confirm that the Gopuram is nothing but the symbol of the feet of God!

When we have the darshan of the feet of God- what else do we need? Now you can guess why the Gopuram was built so high! You can have the darshan of the Gopuram- rather the feet of god from any distance! Thus away from temple may not make us away from GOD! God's grace is very high! That is why Gopuram is very high!

Symbolically, the Gopura or the entrance to the temple represent he feet of the deity. A devotes bows at the feet of the Lord at the entrance as he steps into the temple and proceeds towards the sanctum, leaving behind the world of contradictions.

In concept, the crest of the Gopuram has the same significance of representing the central Brahmasthan which is the energy field of any building. This energy field in three dimension is taken to the top level of the gopuram and this confers spiritual benefits the visitors of the to In the Sri Rangam temple the seven concentric prakara walls are said to represent the seven layers of matter-earth, water, fire, air, either, mind and intelligence-that envelop the consciousness of the living entities in the material world. The Gopuras are symbolic of being liberated from the bondage of matter as one enters the temple and proceeds toward the central The Gopura also emphasizes the importance of the temple within the city. Gopuras came in rather late during the mid-12th century in evolution of Dravidian or South Indian Temple Architecture and probably due to security reasons.

With the increasing threat from invading armies, the temple cities found it expedient to erect a series of protective walls to safeguard and defend their temples, palaces and cities. The Gopuras constructed on the gateways leading from one enclosure to the next, initially, served as watch towers for defense.

Among the finest examples are the Sundara Pandya Gopura of the Jambukesvara temple at Tiruchchirappalli, the Gopuras of the great Shiva temple at Chidambaram and the Gopuras of the Meenakshi temple at Madurai.

Meenakshi temple has twelve impressive Gopuras over the three tier Prakara walls. The outer four towers are nine -storied with heights ranging from 161 feet to 170 feet

Gopuras appear to have influenced revision in the temple design and layout. The spaces around the shrine became hierarchical; the further the space was from the main shrine, the lesser was its eminence. The outermost ring had buildings of a more utilitarian or a secular nature - shops, dormitories, sheds, workshops etc., thus transforming the temple from a purely place of worship to the hub of a vibrant living city.

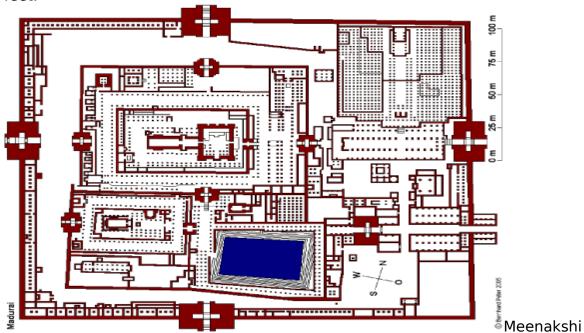
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temple Madurai.India layout

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A particularly interesting example of this is the Sri Ranganatha temple at Sri Rangam, which has seven enclosure walls and as many as twenty-one Gopuras, the seventh, the outer most enclosure encloses an area of about six hundred acres.

The gopuram was constructed to large heights this is because the old people who cannot come to temple can also pray their god by sitting at their place just seeing the gopuram.

Cultural Importance:

In ancient days, Temples served as the major landmarks of the land. A place was identified either using the palaces or temples. As the palaces were prone for being ruined due to invasion, temples served as the major landmark for the passengers. In order to facilitate the traveling folk to identify the locations easily, the Gopuram's of the temples have to be built at high. Thatpaved way for the high Gopuram's. By means of seeing the Gopuram's from distance, passengers calculated the approximate distance of their destination from their location. Gopuram's were built very high to serve as landmarks as well as for passenger distance's Further, temples served as the main shelter for travelers. When people travel between places, they stay at the temple premises to take rest. Before they begin the new part of their journey, they would worship GOD and start.

Scientific Reason:

Gopuram acts as a lightning arrest. A metallic object mounted on top of a building, electrically bonded using a wire or electrical conductor to interface with ground or "earth" through an electrode, engineered to protect the building in the event of lightning strike. If lightning targets the building it will preferentially strike the rod and be conducted to ground through the wire, instead of passing through the building, where it could start a fire or cause electrocution.

The science behind these constructions is that, the temple architecture gives cosmic energy to the main deity in the Garbha Griha. Firstly, the Juathaskambam acts like an antenna and receives the cosmic energy from the space and through an underground channel it is connected to the main deity in the Garbha-graha. The cosmic energy constantly flows through the Jathuskambam to the idol and energies the it. Secondly, the celestial power drawn through the dome gives the deity effulgence and metaphysical powers. The cosmic-energy is further maintained by sound waves (Vedic chants) and the pyramid like tomb. The pyramid like structure helps to amplify and preserve the cosmic energy. These are the reasons for anyone to feel a positive energy, goodness, calmness or divinity when we approach the inner sanctum.

The copper plate has the tendency to suck part the Ether when that penetrates through the copper and the Herbal resulting in powerful atomic energy that penetrates through the skin to cure the human, and that's why the copper plate is put on the temple tower.





GO PURAM-COW

SHED

Gates: Gopurams act as a gates to the temple-town. Speaking from the context of Tamil Nadu, there are a lot of temple-towns (like Chidambaram, Rameshwaram, Palani etc..) . In these towns, almost the entire population is concentrated in the area around the temples. During the ancient times, the temples were used not just as a place of worship, but also a place of learning (schools), a place for trade (markets) and also as a Dharamshala (resting place for tired travelers). You need to be adequately protected as forts were not an intricate part of Tamil architecture back then. The four gopurams, one facing each direction acted as a gate.

Watch-towers: As another answer pointed out, gopurams are also used as a watch-towers by the kings to watch out for any invading enemy. As I said, forts were a recent addition and before that, it was the temples which did a good job.

Architecture: I am a novice when it comes to art and architecture, but the gopurams were also a show-case of creativity. It is also proof that ancient India had supreme building artists and designers. A classic case is the gopuram of the Thanjavur main temple.

Im**pressionistic:** Tall gopurams are a way of creating a first impression for any new comer entering the city. Before the advent of modern buildings, the temple gopuram is usually the tallest building in the town that could be seen at a distance of even more than 10 kms. Even today, when you take a drive along National Highway-45, near Trichy, you can see the gopuram of Srirangam temple from the Kaveri bridge. Even though the Kaveri is completely dry, the sight of gopurams would not be lost on someone who admires Tamil Nadu's rich history.

Srirangam gopuram as seen from the bridge, a distance of more than 5 kms.

Showcasing the history: Gopurams show-case the history is pics or by statues. Thats what the statues of the gods are for. They show case the mythology and the history behind that place.

A *Gopura* is generally constructed with a massive stone base and a superstructure of brick and pilaster. It is rectangular in plan and topped by a barrel-vault roof crowned with a row of finials.

When viewed from top, the Gopura too resembles a Mandala; With sculptures and carvings of Yalis and mythical animals located in the outer enclosure. Humans and divine beings are in the inner enclosures. The peak of the *Gopura*, the *Kalasha*, is at the centre of the *Mandala*

ETMOLOGY: The Sanskrit word, <code>\[\]\[\]\[\]\[\]\[\]\</code>, is often translated as "town gate". Separately, it consists of two words go, with the possible meanings of "cow" or "sky", and pura, meaning city. The word was borrowed into Tamil where it is

pronounced kopuram and given a folk etymology of derivation from the two words: $(K\bar{o})$ and (puram) meaning 'King' and 'exterior' respectively. It originates from the Sangam age when it was known as meaning 'Imperishable gateway'. Adhering to the orthodox grammar of sankattamil (Classical Tamil), it would be pronounced kohpuram as the velar is always voiceless in the Tamil language.

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PHYSICAL IMPORTANCE:

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Symbolism of 'Gopuram'

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A particularly interesting example of this is the Sri Ranganatha temple at Sri Rangam, which has seven enclosure walls and as many as twenty-one Gopuras, the seventh, the outer most enclosure encloses an area of about six hundred acres.



Chidamba



Meenakshi Temple, Madurai 7 GOPURAMS

Decorations: Gopurams are exquisitely decorated with sculpture and carvings and painted with a variety of themes derived from the Hindu mythology, particularly those associated with the presiding deity of the temple where the gopuram is located. EPILOGUE:θA gopuram is usually rectangular in form with ground-level wooden doors, often richly decorated, providing access. Above is the tapering gopuram, divided into many storeys which diminish in size as the gopuram tower narrows. Usually the tower is topped with a barrel vaulted roof with a finial.

Form: The form began rather modestly in the 10th century, as at Shore Temple, Mahabalipuram, with the 11th century Brihadeeswarar Templein Thanjavur marking a crucial step forward with two multi-storey gopurams from that period, much larger than any earlier ones, though much smaller than the main tower of the temple. The four gopurams of the Thillai Nataraja Temple, Chidambaram are important early examples, begun in the mid-13th century but completed over a longer period.

It also dominated the inner sanctum in amount of ornamentation. Often a shrine has more than one gopuram. They also appear in architecture outside India, especially Khmer architecture, as at Angkor Wat. θ The gopuram's origins can be traced back to early structures of the Tamil kings Pallavas; and by the twelfth century, under the Pandyarulers, these gateways became a dominant feature of a temple's outer appearance. θ This forms a prominent feature of Koils, Hindu temples of the Dravidian style. They are topped by the kalasam, a bulbous stone finial. θ A Gopura (singular) (Sanskrit: θ A) or Gopuram (plural) is a monumental tower, usually ornate, at the entrance of any temple, especially in Southern India.

Generally, these do not assume as much significance as the outer gopurams, with the exception of a few temples where the sanctum sanctorum's roofs are as famous as the temple complex itself. The Ananda Nilayam gopuram- vimanam of the Tirumala Venkateswara Temple is a famous example where the gopuram of the main shrine occupies a very special place in the temple's history and identity. θ A koil may have multiple gopurams, typically constructed into multiple walls in tiers around the main shrine. The temple's walls are typically square with the outer most wall having four gopura-vimanas, one each on every side, situated exactly in the center of each wall. The sanctum sanctorum and its towering roof (the central deity's shrine) are also called the vimanam.

Tallest Gopurams:

Murudeshwara Temple 236 FT Annamalaiyar Temple 216 FT Srivilliputhur Andal Temp 193 FT Tallest gopurams :

Ulagalantha Perumal Temple 192 FT Meenakshi Amman Temple 170 FT Rajagopalaswamy Tem 154 FT

An example of a Gopiram with exquisite design is found at Thirukkurungudi in Thirunelveli District is famous as it is home to a large and beautiful temple for Vishnu dedicated to Azhagiyanambi. This temple is a Divya Desam (sacred abodes of Vishnu sung in praise of by the Azhvars or important Vaishnava devotees). The deity has been praised in the Tamil verses (Pasuram) of Nammazhvar, Periazhvar, Thirumazhisai Azhvar and Thirumangai Azhvar. At the entrance is a gopuram which is incomplete.

Next is the Chittiral gopuram which has many unique sculptures on the stone base and wood carvings inside. In front of this gopuram is a mandapam, which has exquisite stone sculptures which are part of the huge monolithic pillars. Azhagiyanambi, the principal image, in a standing posture is made of stucco (sudhai) and painted in the traditional mode (varna kalapam). This image is a very beautiful one about whom Nammazhvar has waxed eloquent.

There are two more sanctums in this temple for Vishnu in seated and reclining postures also. The image in a seated pose is known as Veetrirunda Narayanan

and is seen with Goddesses Sridevi and Bhudevi. Pallikonda Nambi is Vishnu reclining on Adisesha with Brahma seated on the lotus emanating from Vishnu's navel. Goddess Lakshmi is worshipped as Thirukkurungudi Nachiyar. The image of Andal here is unique as this deity is seen with four hands.

The upper hands hold lotuses while the lower right hand is in abhaya hasta and lower left hand is in varada hasta. In the Thirunelveli region, Andal is generally seen like this. Ramanujacharya, the famous Sri Vaishnava preceptor (Acharya) had a close connection with this temple. This temple is associated with a moving episode of Nampaduvan, a devotee of God Nambi who sung before this deity every day. He was so sincere that he was prepared to give himself up to a Brahmarakshasa (evil sprit). This is mentioned in the Kaisika Puranam and celebrated during the Kaisika Ekadasi in this temple.

Three forms of Vishnu

The standing, seated and reclining forms of Vishnu are worshipped in this temple **Ramanujacharya**

This preceptor had a close connection with this temple

Inscriptions

Many epigraphs mentioning donations are found here.

Vijayanagara-era 'gopuram' in a state of neglect



A view of the 'Gopuram' near Chandragiri fort. | Photo

Credit: SpecialArrangementower may collapse because it has developed a six inch-wide vertical crack

An ancient 'gopuram' in the vicinity of the famed Chandragiri fort symbolising the architectural grandeur of the Vijayanagara era is in a state of neglect, indicative of both

civic indifference and official apathy.

The 100-ft tall structure is made of granite stone up to the roof, with brick and lime mortar forming part of the super structure. The tower has developed a six inch-wide vertical crack, the plastering has peeled off and the stucco sculpture

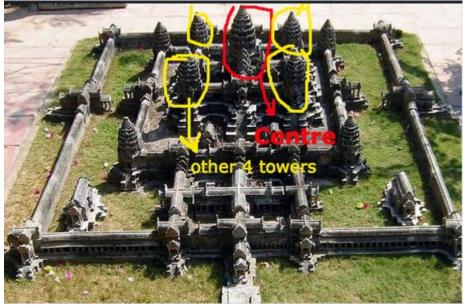
is in a bad shape, not to mention the wild growth of shrubs in the vicinity of the 'uncared for' structure. The Gopuram is located near Reddivaripalle village in Chandragiri mandal, dotted with such dilapidated structures of the Vijayanagara era, many of them built when the dynasty ruled the region with Chandragiri as its capital.

This Reddyvaripalle was known as Siddhankuttai in the erstwhile Valanadu district. The link has been established by noted archaeologist E. Sivanagi Reddy, Chief Executive Officer of 'The Culture Centre of Vijayawada and Amaravati'. The village finds a mention in an inscription engraved on the outer wall in the first precincts (Prakara) of Tirumala temple, which dates back to 1433 AD during the reign of Sri Veera Pratapa Devaraya II (Praudha Devaraya).

According to Gopi Krishna, a senior research scholar on the TTD temples, the inscription records an agreement among Sri Venkateswara temple treasury, the temple authorities and the Mahajanas of the village. It grants 50% of revenue of Siddhankuttai village in Kottala Sthalam within Vaikuntha Valanadu district to the 24 Mahajanas of the Srinivasapuram Agraharam for performing Veda Parayanam in Srivari temple, on condition of having two persons among them each day in the presence of the deity of 'Tiruvenkatamudaiyan' (the Tamil name for Lord Venkateswara).

"Based on this inscription, we have identified Siddhankuttai as Reddivaripalli," Dr. Sivanagi Reddy told *The Hindu*. Under the scheme 'Preserve heritage for posterity', he recently visited the site along with heritage activist B.V. Ramana and 'Sthapathi' Dr.P. Subramani. Interestingly, the 'Kottala Sthalam' mentioned in the inscription is the current day Kotala, the nearest railway station on the Tirupati-Pakala route, located 3 km from the ruins.

Temple Gopuram as Cosmos & spiritual light house

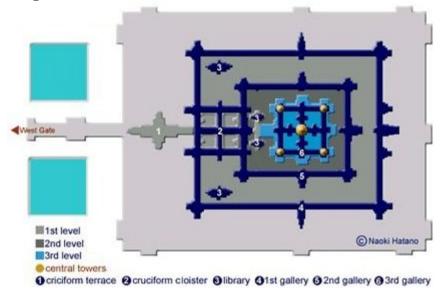


The Quincunx of Towers at the centre of Angkor Wat

ANGKOR WAT

Angkor Wat is a very elaborate temple, built on three levels, and it is very difficult to envision from written descriptions. This tour takes you through the temple in the fashion you are most likely to encounter it on a tour. Let us begin with a general description of the complex Vertically speaking, Angkor Wat is built upon three levels, with the third level leading to its famous five peaks. When viewed architecturally and functionally, the complex can be divided into two areas:

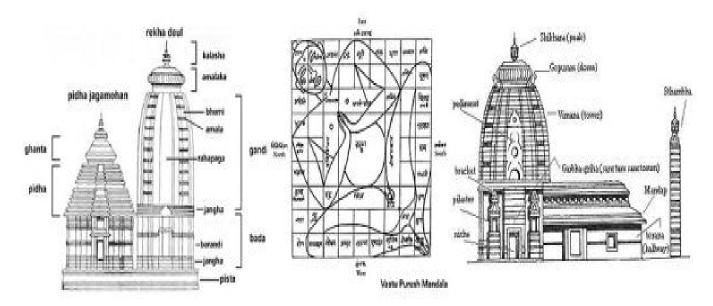
 The outer courtyard: extending from the moat to the wall complex shown above, including the cruciform platform (*Figure 1* in the both the diagram above and below)



- The inner temple complex: the main area enclosed by the complex walls, divided into two squares:
 - a cruciform cloister and libraries near the western entrance on the second level
 - a larger cruciform terrace on the third level that includes offices and the temple itself.

The numbers on the tour below correspond to the path most visitors take when visiting Angkor Wat. Tours begin by turning right at the cruciform platform, following the terrace on level one. Angkor Wat boasts the world's largest bas-relief, extending all the way around the temple, protected by a covered walkway. Upon returning to the entrance, visitors can ascend the stairs to the cruciform cloisters on the second terrace. Stairs from the cloisters lead to the third terrace and the cruciform terrace that contains the main temple.

Angkor Wat was built by the king of the Khmer Empire first as a Hindu, then a Buddhist temple complex. It is known as one of the largest monuments ever built. Hence, this great Buddhist temple provides clear, physical evidence that Hinduism and Buddhism were brought to the region by the Indians, and adopted by early Southeast Asian empires like the Khmer Empire.



The pagodas of Angkor Wat are also a physical depiction of the Hindu concept of Mandala. In addition, the gates of the temple also resemble the gates of the symbol of Mandala. This concept is Hindu in nature and is believed to have been brought to pre-modern Southeast Asia from India. It is probable that these ideas were then "borrowed" by the Khmer Empire, and depicted through its great temple.

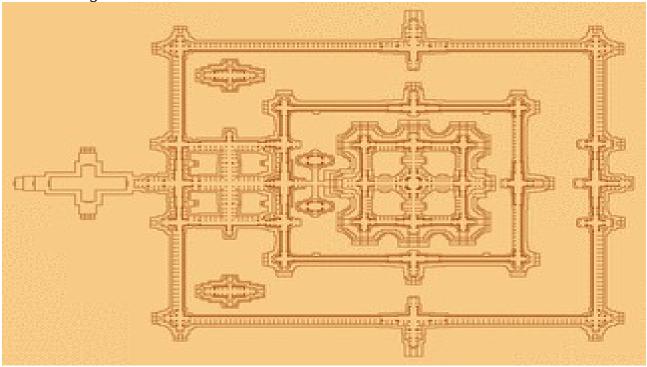


Angkor Wat also has a Gopura. A Gopura is a monumental tower often built at the entrance of temples - a distinctive feature of South Indian architecture. The presence of this structure at Angkor Wat indicates that there was Indian influence in the architecture of the Khmer.Empire.

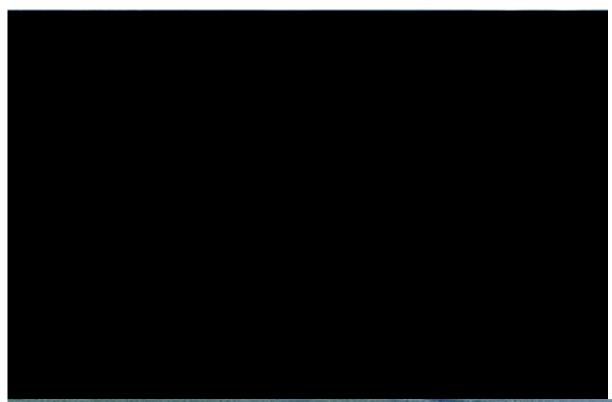
In addition, the temple has many bas-reliefs depicting stories from the Indian epics, the Mahabharata and Ramayana. This shows that these stories were clearly influential in early Southeast Asia as they repeatedly adorn the walls of Angkor Wat, which was seen as a sacred and important place. This demonstrates just how strong Indian influence was in the Khmer Empire.

Furthermore, even though hundreds of years have passed, Angkor Wat is still a national symbol and major source of pride of Cambodia today. The fact that Indianisation of the Khmer Empire from the 7th to 14th century has continued to shape the heritage and identity of modern Cambodia indicates the lasting impact Indianisation had on the region.

Note how the architectural layout of the temple greatly resembles the symbol of Mandala. For example, you can spot the building's centre point, as well as the four gates on the outermost wall.



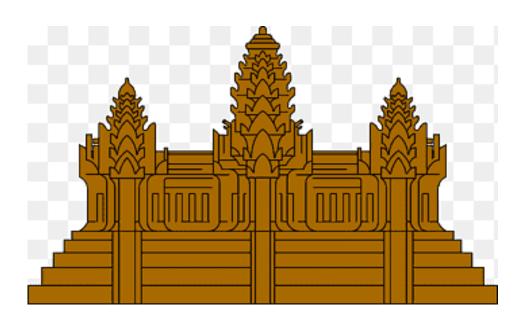
Rough Layout of Angkor Wat



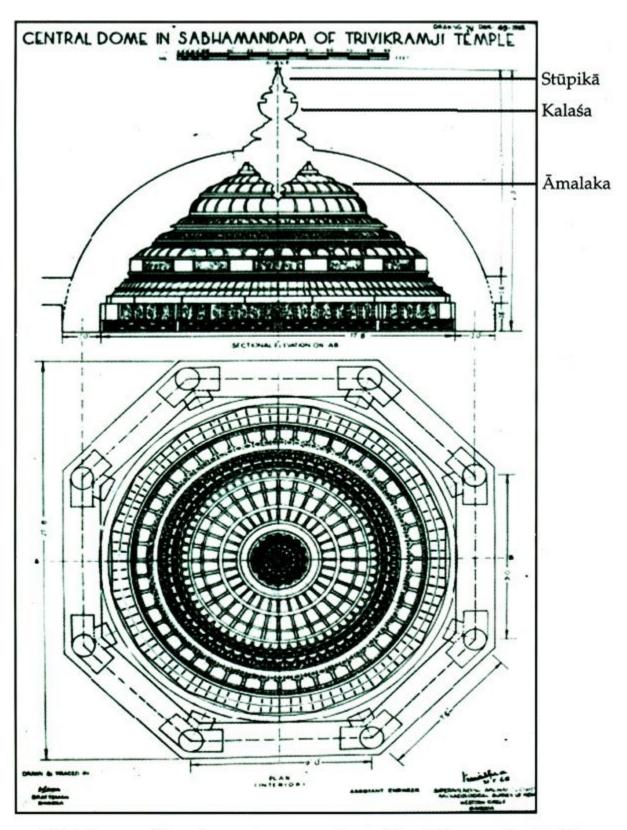




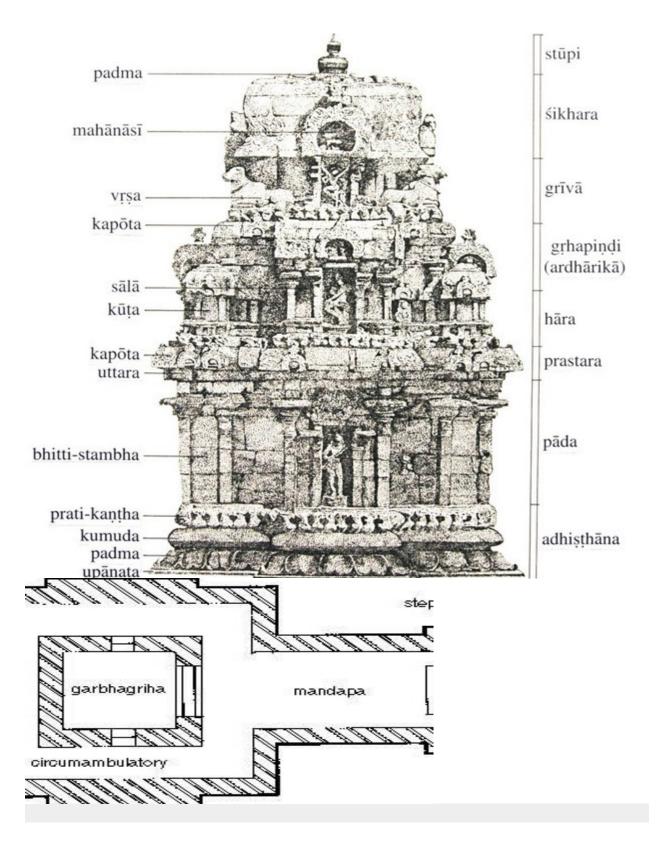
The Third Tier GOPURAM







Pl. 2: Figure of the plan and cross-section of the śikhara, with stūpikā.



ANGKOR WAT

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	GOPURAS in Temples	NO.	
	·	Of Gopuras	
1	Angkor Wat	5	
2	Phom Bakheng ^A	24	
3	South Gate of Angkor Thom	1	
4	Bayon	1	
5	Bauphon	1	
6	Terrace of the Elephants	0	Terrace
7	Terrace of the Leper Kings	0	Terrace
8	Preah Khan	1	
9	Banteay Prei	1	
1	Thommanon	1	
1 1	Choasay Tevada	1	
1 2	Ta Keo	1	
1 3	Neak Pean	1	
1 4	Ta Som	2	
1 5	Banteay Srei	1	
1 6	East Mebon	1	

1 7	Pre Rup	4	
1 8	Sras Srang	0	reservior
1 9	Prasat Kravan		
2	Banteay Kdei		
2	Ta Prohm		
2 2	Victory Gate	0	Gate

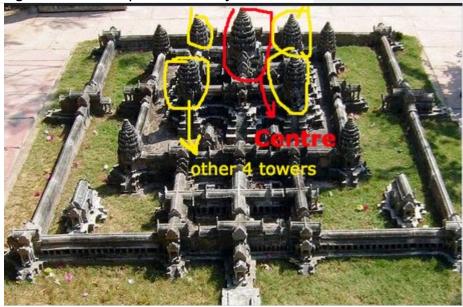


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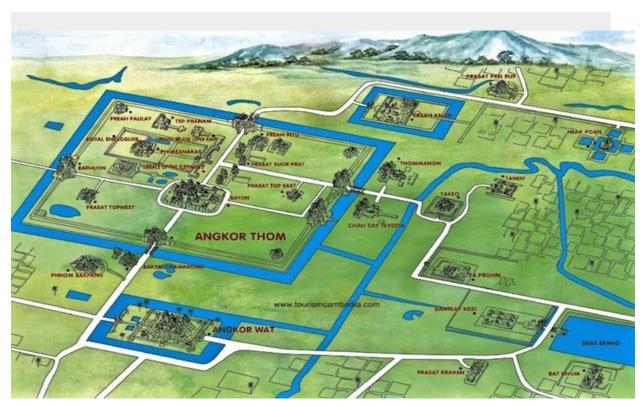
The layout of Angkor Wat closely resembles that of a mandala, although it deviates from the conventional form of a mandala. Angkor Wat's layout retains the core elements of a mandala, namely the presence of concentric shapes, the T-shaped gates at the 4 cardinal points and also a "central being", which is represented by a tower.

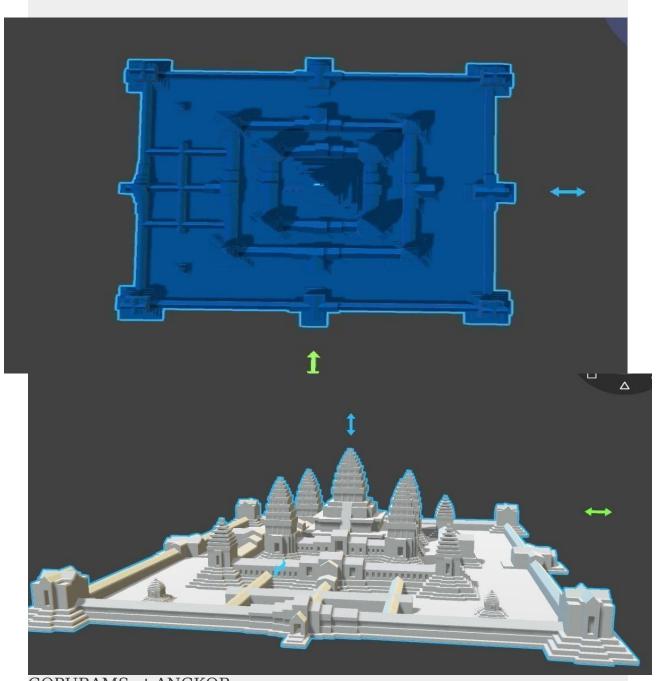


The quincunx (the arrangement of 5 elements where 4 elements are placed as the corners of a square and the 5th in the centre) of towers in Angkor Wat is a symbolic representation of the five peaks of Mount Meru. This sacred mountain is regarded in both Hinduism and Buddhist cosmology to be the centre of all physical, metaphysical and spiritual universes, and the abode of the gods. As such, the quincunx represents enlightenment and ascension to a higher spiritual level, which may be why as the closer you move to the centre of the mandala in the picture as shown, the taller the towers are. This represents the idea of ascension. The placement of towers also represent the mandala. They are placed diagonally, such that it creates the visual impression of something radiating outwards.



Thommanon consists of a simple layout of a central cruciform sanctuary (as introduced at Ta Keo) with a gopura attached to the main entrance (as introduced at Banteay Srei). It was the similarities of the apsara carvings with those of Angkor Wat, however, that helped archaeologists date this temple.



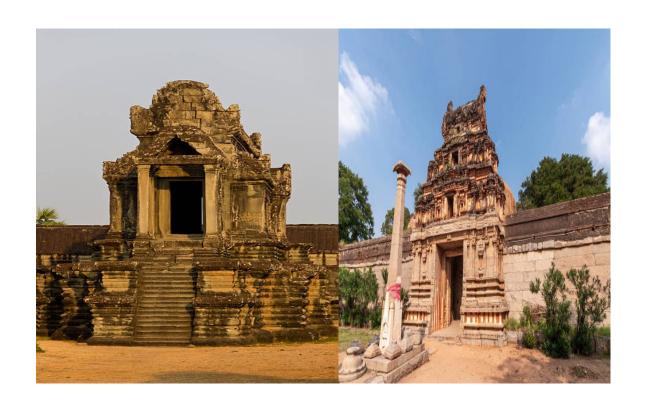


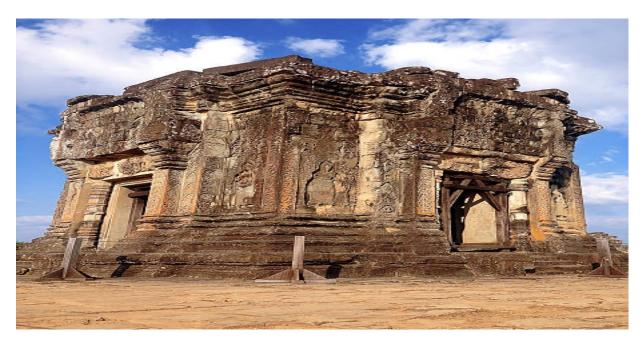
GOPURAMS at ANGKOR

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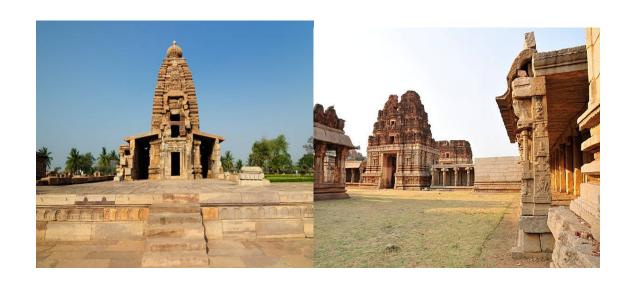
Temple on the top of Phnom Bakheng, Angkor, Cambodia















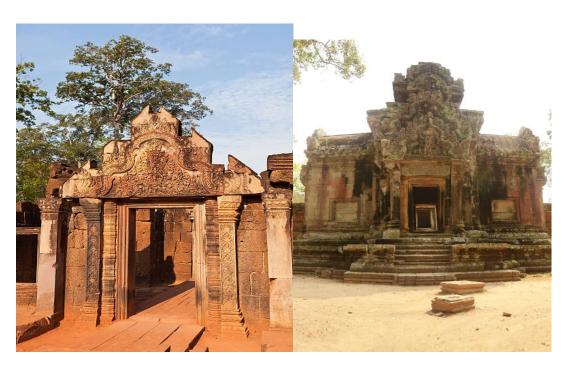














ABOUT THE AUTHOR DR UDAY DOKRAS



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About the Author

The author has worked for 30 years in the human resources arena in India and abroad. He was Group Vice -President of MZI Group in New Delhi and has anchored Human Relations in Go Air and Hotel Holiday Inn; was General Manager-Health Human Resources at the Lata Mangeshkar Hospital amd Medical college. Is currently Consultant to

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In Sweden he anchored HR in Stadbolaget RENIA, SSSB and advisor to a multi millionaire. He has studied in Nagpur, India where he obtained degrees of Bachelor of Science, Bachelor of Arts(Managerial Economics) and Bachelor of Laws. He has done his Graduate Studies in labour laws from Canada at the Queen's University, Kingston; a MBA from USA, and Doctorate from Stockholm University, Sweden. Apart from that he has done a Management Training Program in Singapore.

A scholar of the Swedish Institute, he has been an Edvard Cassel Fund and Wineroth Fund Awardee. A scholar for the Swedish Institute for 5 years.

In 1984 he was involved with the Comparative Labour Law Project of the University of

California, Los Angeles, U.S.A. He was also visiting lecturer there. In 1985 he was invited by the President of Seychelles to do a study of the efficacy of the labour laws of Seychelles.

Author of a book on a Swedish human resource law, his brief life sketch is part of the English study text book of 7 th Class Students in Sweden -"Studying English. SPOTLIGHT 7"- and 8th Class students in Iceland - "SPOTLIGHT 8- Lausnir."

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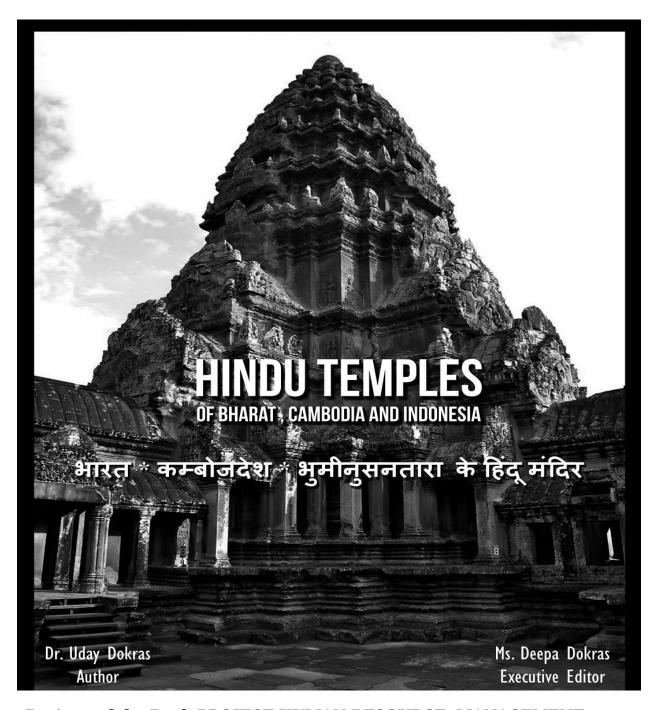
Authors-DR Uday DOKRAS

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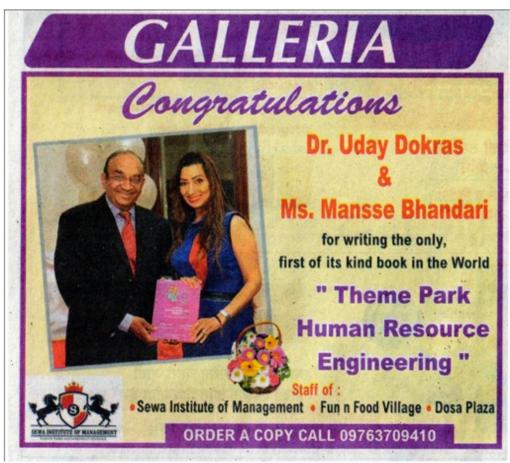
Certificat'e en Droit, Queen's University. Ontario, Canada, MBA, CALSTATE,Los-Angeles, USA, Ph.D. Stockholm University, Sweden, Management and Efficacy Consultant, India



Reviews of the Book PROJECT HUMAN RESOURCE MANAGEMENT

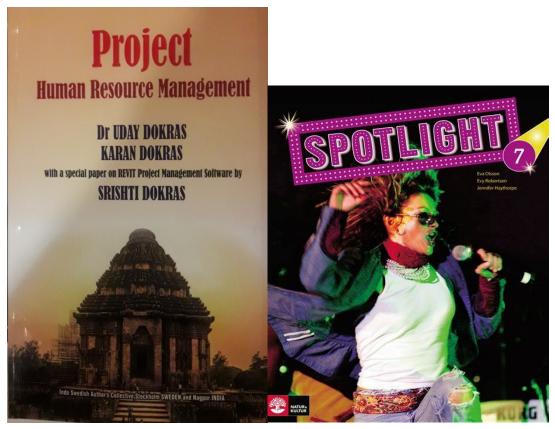
The authors highlight the benefits of paying attention to human resources and offer success and failure factors guideline for a variety of potential practitioners and students in global project marketplace.

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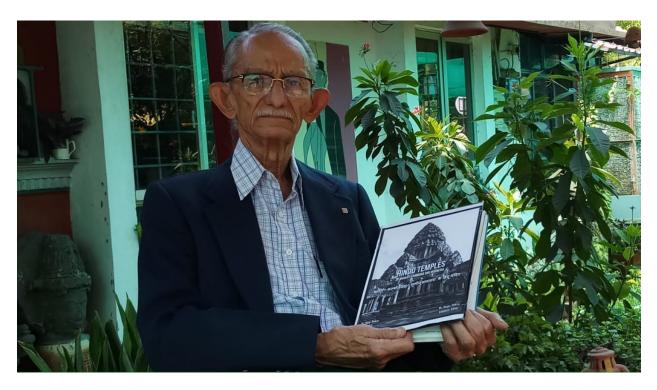


From the Newspaper Times of India March 24, 2018





Iceland Sweden both countries use the English Text SPOTLIGHT-one of the lessons in which is about Dr Uday Dokras



Prof. S.Deshpande, President of the Indian Instituye of Architects, New Delhi INDIA releasing the book of Dr Dokras HINDU TEMPLES on the web in CARONA gimes (May 2010)

Book on 'Theme Park HR' launched

■ Staff Reporter

THE book 'Theme Park Human Resourse Engineering' written by authors Dr Uday Dokras and Mansse Bhandari recently.

Speaking on the occasion Balwant Chawla, Chairman, The Polo Amusement Group, New Delhi And Tashkent, Uzbekisthan the chief guest, complemented the writers for choosing such an unique subject and writing this one of a kind book. First in the world on this subject.

This book is a comprehensive guide to manage employees working in all entertainment related businesses such as Malls, Theatres, Multi-plexes, amusement and Theme parks, Casinos, Malls, family entertainment centers etc.

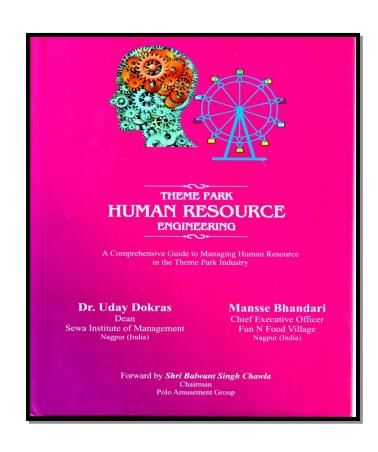
In 11 chapters the authors deal with recruitment, training, discipline, bringing about efficiency and value add to the business using human resource interventions. This is the first book of its kind in the world and is the first time the subject has been tackled. The authors Mansse Bhandari and Dr Uday Dokras have been associated in the Human Resource field for 30 years. Ms. Bhandai is the CEO of Fun 'N' Food Village, Nagpur and was head of Human Resource at the Iceland Park in Dubai for 5 years. Dr Uday Dokras has written 2 other books on HR and was Head HR of GO Airlines in Mumbai. He has been the GM of Hotel Holiday Inn, Mumbai.

This book has been published by the Sewa Institute of Management, a new



Dr Uday Dokras and Mansse Bhandari.

Institute that has taken up the challenge of introducing the Theme Park Management Science to the world.



Dr Uday Dokras pens a trilogy on Hinduism

This is 17th book by Dr Uday Dokras and 6th by his daughter

Staff Reporter

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INDOLOGISTS Hindulogists, Dr Uday Dokras and his daughter Srishti Dokras, an Architect have just released their trilogy on Hindu temples of South-East Asia and Indo China, titled 'Devraja'

on the Net.

This is the 17th book by Dr
Dokras and sixth by Srishti
Dokras. Between the two, they have written 160 research papers on temple construction, Hindu religion in far away nations, design and manage-ment available for all to read on researchgate.net.

Spanning 1,200 pages in 3 volumes, the tales are centered on Devraja, the God King of many of these countries who embraced Hinduism and built some of the biggest and most majestic tem-



Dr Uday Dokras and Srishti Dokras

ple monuments in honour of God Vishnu far away in Cambodia and Indonesia. "How many of us know that

Garuda, the giant bird which is Lord Vishnu's vehicle is the national symbol of Thailand, holds a *Trishul* in its hands and name of the national air carrier-is Garuda Airways or that the national flag of Cambodia depicts a Hindu tem-

ple on it - The Angkor Wat. Even fewer know that the Cham people of Vietnam are Brahmins or that the king of Thailand has Hindu priests performing all religious rituals in spite of being a Buddhist - as a national tradi-tion," said Dr Dokras. Devrajas or God King and Raja

Dharma or Hinduism flourished in South-East Asian countries for more than 400 years and con-structed the largest Hindu tem-ples in the world. These 3 volumes trace the significance and history of these developments of how the Hindu religion spread to these countries, its expediency in making the Kings of these nations Devrajas, under Hinduism, in order to better lead their people, informed Dr Dokras.

The introduction to the book has been written by famous British Artist Kenny Perry, who is associated with Dr Uday Dokras' books and has con-tributed original digital art to adorn this picturesque trilogy full of more than 300 art works.

Prof Deshpande launches two books of Dr Dokras

PROF SA Deshpande, former Head of the Department of Architecture, Visvesvaraya National Institute of Technology and President of the Indian Institute of Architects, e-launched two books of Dr Uday Dokras.

Prof Deshpande appreciated Dr Dokras for writing three books in three months during lockdown. While e-launching the books, he said, "Time will always go by. What distinguishes us is how we use

that time for our benefit.'

The two new books by Dr Uday Dokras, who has done PhD from Sweden and is son of former PrincipalVRCEVasant Dokras, are about 'Hinduism -- Celestial Mysteries of the Borobudur Temple' and 'Mysteries of the Holy Flower Lotus'. Dr Dokras was once consultant for Gorewada Zoo. Presently, he works for Kettle &

(Left) Prof S A Deshpande and



Brew Beverages, Pune as online

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(Left) Prof S A Deshpande and Dr Uday Dokras releasing books.

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on April 31, Dr Dokras had launched the book Hindu Temples of Bharat & Cambodia. Hindu temples and symbolism has existed for several years. It is a fascinating subject that needs to be brought to light for all interested in the mysteries of Hinduism. All of Dr Dokras' 10 books are available gratis for reading on academia.edu and https://www.yumpu.com/en/human2resources, stated a press release.

Dr.Uday Dokras

Ph.D (Stockholm, Sweden) MBA (U.S.A)

Author of 14 books, 150 papers. Find me on Academia.edu and Researchgate.com

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City author launches book on web from home

■ Staff Reporter

RENOWNED author Dr Uday Dokras, a prolific writer has penned a 450 page book on the Hindu Temples of Bharat and Cambodia. It is his eighth book and his coauthorforthis book is Deepa Dokras, a noted historian. He launched the book directly onto the worldwide web from home.



The book deals with how Hinduism reached the far East and the architecture of Hindu temples there and here in our country.

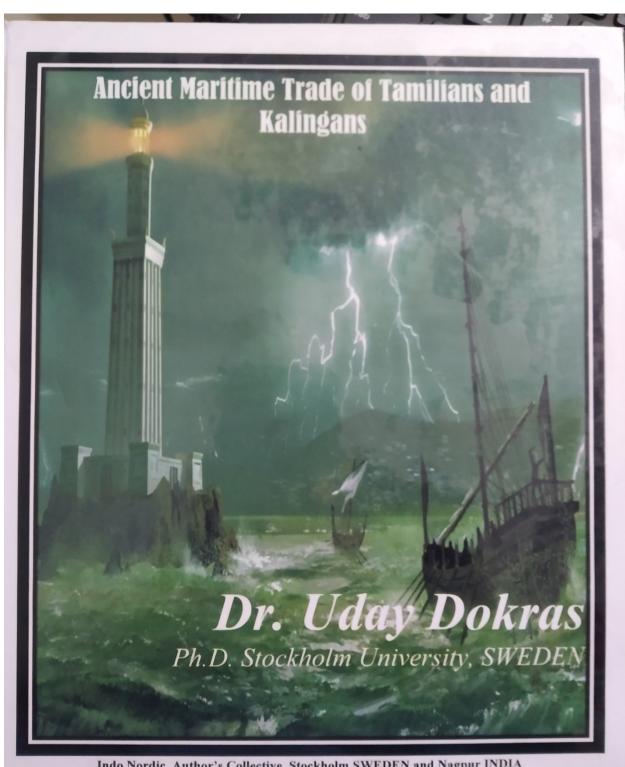
There is very little research done on this subject, claims Dr Uday and Deepa Dokras. Both described the technical aspects of building these temples as well as focuses in detail on temples of Nagpur and others in Cambodia and India.



Some of my books



DR. UDAY DOKRAS DEEPA DOKRAS



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